

Stratigraphy

Code: 101064
ECTS Credits: 6

Degree	Type	Year	Semester
2500254 Geology	OB	2	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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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

Eduard Remacha Grau
Joan Santamaria Casanovas
Ruben Calvo Tortajada
Joan Poch Serra

External teachers

Ramon Mercedes

Prerequisites

Although there is no official prerequisite, students are advised to have good knowledge of the subjects that were taken during the first year of degree, particularly: Fundamentals of Geology (Fonaments de Geologia) and field work of Regional Geology (Treball de camp de Geologia Regional).

Objectives and Contextualisation

Training objectives of the subject:

Acquire the theoretical and practical knowledge about the descriptive and

Objectives of the practices:

- Recognize rocks and sedimentary structures in the laboratory and in the field
- Representation of stratigraphic sections
- Establish simple stratigraphic correlations

Competences

- Describe stratigraphic successions and their temporal dimension and use correlation and interpretation techniques.
- Display understanding of the size of the space and time dimensions of Earth processes, on different scales.
- Draw up and interpret geological maps and other means of depicting geological information (columns, correlation frames, geological cross-sections, etc.)
- 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.
- Work in teams, developing the social skills needed for this.

Learning Outcomes

1. Draw up stratigraphic columns and correlation frames.
2. Interpret the spatial and temporal significance of stratigraphic successions and the different types of lithostratigraphic units with chronostratigraphic value.
3. Learn and apply the knowledge acquired, and use it to solve problems.
4. Make stratigraphic columns and correlation frames and geological maps based on lithostratigraphic and chronostratigraphic units.
5. Process stratigraphic and sedimentological data from the field in order to produce new synthesis data and documents.
6. Work in teams, developing the social skills needed for this.

Content

PROGRAM OF THEORETICAL CLASSES

- 1-Introduction to Stratigraphy: definition, principles and objectives
- 2-Transport and sediment structures: introduction, selective transport, mass transport
- 3- Sedimentary structures (depositional and non-depositional).
- 4-Formation of sedimentary rocks: meteorization and its products and diagenesis.
- 5-Clastic sedimentary rocks: components and classification.
- 6-Carbonate sedimentary rocks: components and classification.
- 7-Transgressions, regressions, cyclicity and sequence stratigraphy
- 8-Stratigraphic exploration of georesources.

PROGRAM OF LABORATORY PRACTICES

Origin and type of sediment grains (carbonates)

Origin and type of sediment grains (terrhenes)

Sedimentary structures I and paleocurrent measurement

Sedimentary structures II

Preparation of stratigraphic seccions and use of the Jacob staff. Creation of stratigraphic columns

PROGRAM OF CAMPING PRACTICES

- a) Regional geological context.
- b) Recognition of formation and sedimentary rocks in space and time
- c) Recognition of sedimentary structures and paleocurrent measures
- d) Raise a local stratigraphic series. Use of the granulimeter, metric tape and stick of Jacob

Methodology

1.- Managed activities

Theory lessons:

The program contents will be taught mainly by the teacher in the form of theoretical classes. The student acquires the scientific-technical knowledge of the course by attending the classes 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 consult the 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 facilitate to understand and consolidate the contents of the theory program. They also familiarize the student to the data obtaining procedure, treatment and application to create stratigraphic columns.

The student will have downloaded the practice script for the virtual campus, which will be developed during that group session of two or three people. 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 the teacher of the subject can request at the end of the session (individually or by group).

Eventually, each student will release to the teacher the compilation of all practical, duly corrected and expanded practises.

Field practices

These consist of two field trips where several types of materials and structures will be identified. It will work with granulimeter, magnifying glass, compass to measure paleocurrents, measuring tape and Jacob's staff. This information will be discussed later in laboratory practices.

Special emphasis will be placed on the student collecting all the data in the field book, which can be evaluated.

2.- Supervised activities

Two types of supervised activities are proposed:

- a) Elaboration of works derived from laboratory and field practices by groups
- b) Group and individual tutorials in order to support the training activities indicated above.

3.- Autonomous activities

Includes study, work preparation and reading of bibliography

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field work	14	0.56	3, 4, 1, 6
Laboratory practices	19	0.76	5, 3, 4, 6
Theoretical lessons	18	0.72	5, 2
Type: Supervised			
Elaboration of works derived from laboratory or field practices	14	0.56	4, 1
Group or individual mentoring	3	0.12	5, 3, 4, 1, 2, 6
Type: Autonomous			
Study, consult of references, report performance	75	3	

Assessment

The overall grade of the subject will assess the knowledge acquired by the student in the different activities:

theoretical classes, laboratory practices, field practices

The evaluation of the subject will be individual and continued through the

1.- Theoretical contents of the exam (80%)

During the semester there will be two compulsory partial written tests on

2.- Practical contents of the exam (20%)

This part of the final and partial examinations will be based on the conter

3.-Field practices

The evaluation of field work (which is absolutely compulsory) will be base
It may also include:

a) the evaluation of an exercise that can be proposed during the field day

b) the evaluation of the field notebooks

c) In the event that a dossier is delivered at the beginning of the excursio

d) the student's attitude at the exit will also be taken into account

IMPORTANT: The field score will be used to improve the qualification of

4.- Recovery test at the end

Suspended partial theoretical tests (note less than 5) may be recovered i

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Contents of the practices in the partial and final exams.	20	0.5	0.02	5, 3, 4, 1, 6
Final recovery test	0	0	0	5, 3, 4, 1, 2
Score of the laboratory practices	0	0.5	0.02	4, 1

Bibliography

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

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- Brookfield M.E. (2004). Principles of Stratigraphy. Blackwell Publishing, Oxford, 340 or
- Nichols, G. (2009) Sedimentology & Stratigraphy. Blackwell Science.
- Pettijohn, F.J., Potter, P.E. i Siever, R. (1987) Sand and sandstone. 2a ed. Berlín: Springer-Verlag. 553 p.
- Reineck, H. E. i I. B. SING. (1973) Depositional Sedimentary Environments. Nova York: Springer-Verlag.
- Ricci Lucchi, F. (1980) Sedimentologia. 2a ed. Bolonya: CLUEB. Vol. 1 i 2.
- Ricci Lucchi, F. (1970) Sedimentografia. Atlante fotografico delle strutture primarie dei sedimenti. Bolonya: N. Zanichelli. 288 p.
- Vera, J. (1994) Estratigrafia (principios y métodos). Madrid: Rueda.

Enllaços web

<http://cit.iec.cat>

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

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

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

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

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