26429 - Basin Analysis

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	296 - Degree in Geology
ECTS	5.0
Year	4
Semester	First semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process that is designed for this subject is based on the following:

The course consists of three complementary parts: theory, laboratory practice and field practice. The proposed activities are based on the transmission of basic and essential knowledge through participatory teaching master classes. This

knowledge is successive in the order of learning and is supplemented by exercises and field activities in which the student demonstrates the degree of understanding and application of concepts, methods and analytical and descriptive used techniques. In addition, the tutorials are a complementary activity in which the student can consult or complete issues it deems appropriate. Finally, students can access various materials related to the subject through the ADD.

For all this we have designed a work schedule that allows addressing the different training aspects with a balanced workload throughout the course.

5.2.Learning tasks

The program offered to the students for helping them achieve the expected results includes the following activities: Lectures, Laboratory classes and fieldtrips.

Lectures: They consist of participatory master classes involving a total of 25 hours.

Laboratory/Cabinet Practices: 7.5 sessions involving a total of 15 hours.

3 fieldtrips, involving a total of 21 hours (10 + 11).

Implementation of activities and exercises (personal work, without the presence of the teacher) mainly related to the cabinet practices, bibliographical work and to a lesser extent, theoretical and field aspects: 20 hours.

These activities and exercises will be reviewed, corrected and evaluated by the teacher.

Querying and study of the theoretical and practical for overcoming knowledge written tests: 42 hours.

Making global written test: 2 hours.

The use of specialized English literature for both theoretical and practical sessions and individualized work has been quantified in 1 ECTS credit in English.

5.3.Syllabus

The theoretical program of the subject is divided into four blocks:

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1. INTRODUCTION TO THE BASIN ANALYSIS

Concept and objectives

Sedimentary basins in their geodynamic context

Plate Tectonics and Wilson cycle

Main basin analysis techniques

2. CONTROL FACTORS OF SEDIMENTARY FILLING

subsidence

Eustasy

Sediment supply

3. SEDIMENTARY BASINS: TYPES

Classification criteria of sedimentary basins

Adopted classification:

Basins formed by extension of the lithosphere

Basins formed by flexure of the lithosphere

Basins associated with directional faults

4. MODELING OF SEDIMENTARY BASINS INFILLING

Introduction to the modelling of sedimentary basins

Software for modelling of sedimentary basins

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Laboratory sessions are organized into four thematic blocks:

- Tools in basin analysis

- Calculation of subsidence. Geohistorical analysis

- Calculation of denudation rates. Evolution of the source area

- Fischer diagrams for recognition of sedimentary cycles

Fieldtrips are organized in 3 thematic blocks:

- Recognition and study of different types of sedimentary basins in a cross Almazan Basin-Cameros Basin-Ebro-Basin (1 day)

- Tectonics-sedimentation relationships in the Ebro Basin (1 day)

- Jaca Basin (1 day)

5.4.Course planning and calendar

Schedule sessions and presentation of works

The course will consist of 5 ECTS (125 hours of student work) to be distributed as follows:

- 25 hours of lectures. The lectures will be held according to the schedule established by the Faculty of Sciences.

- 15 hours of laboratory/cabinet practical. They will be spread over 7.5 sessions of 2 hours. The practical sessions will be held according to the schedule established by the Faculty of Sciences.

- 10 hours of field practices + 11 hours of student work in the field. Field practices are spread over 3 fieltrips, coordinated with theoretical and practical classes. These fieldtrips represent 10 hours of conventional classroom teaching plus 11 hours of classroom student work in the field. Since the development of this subject requires a precise knowledge of the field aspects to understand and assimilate the knowledge imparted in theory and also part of the data used in laboratory practice are taken by students in the field practices, the calendar should be based on the development of theoretical and practical classes. The field calendar is hanging on the Web of the Department of Earth Sciences.

- 62 hours of personal work. It includes the development and implementation of works and diverse practices (20 hours)

and study devoted to the subject (42 hours).

- 2 hours of examination.

The start time and duration of the global test of each call (February and September) will be established in the schedule of examinations of the Faculty of Sciencesand placed at least 3 days in advance in the ADD and the bulletin board of the Stratigraphy Area.

Online resources (Moodle)

https://moodle2.unizar.es/add

5.5.Bibliography and recommended resources

BB	Allen & Allen. BASIN ANALYSIS: PRINCIPLES AND APPLICATION TO PETROLEUM PLAY ASSESSMENT. - 3ª Blackwell. 2013
BB	Einsele, Gerhard. Sedimentary basins : evolution, facies, and sediment budget / Gerhard Einsele . - 2nd, completely rev. and enl. ed Berlin [etc.] : Springer, cop. 2000
BB	Miall, Andrew D.. Principles of sedimentary basin analysis / Andrew D. Miall . - 3rd. updated and enl. ed. Berlin [etc.] : Springer-Verlag, cop. 2000
BC	Allen, Philip A.. Basin analysis : principles and applications / Philip A. Allen, John R. Allen . - 1st pub., repr. Oxford [etc.] : Blackwell Science, 1998
BC	Allen, Philip A.. Basin analysis : principles and applications / Philip A. Allen, John R. Allen . - 2nd ed. Oxford [etc.] : Blackwell Science, 2005
BC	Kleinspehn, K. L. & Paola, C.. New Perspectives In Basin Analysis. Springer-Verlag. 1999

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BC	The sedimentary record of sea-level change / edited by Angela L. Coe ; authors, Angela L. Coe... [et al.] . 1st published, repr. with corrections Cambridge : The Open University ; Cambridge University Press, 2005
BC	Vera Torres, Juan Antonio. Estratigrafía : principios y métodos / Juan Antonio Vera Torres Madrid : Rueda, D.L. 1994