

Academic Year/course: 2022/23

## 63238 - Design of Learning Activities in Biology and Geology

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 63238 - Design of Learning Activities in Biology and Geology

**Faculty / School:** 107 - Facultad de Educación

**Degree:** 584 -

595 -

**ECTS:** 8.0

**Year:** 1

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

## 1. General information

## 2. Learning goals

### 2.2. Learning goals

- Analyse the difficulties and the specific features that suggest the Biology and Geology learning in Secondary.
- Select and assess the most relevant strategies for the learning planning in the class.
- Design didactic proposals and different activities for the learning in Biology and Geology.
- Prepare and organise the needed resources for the configuration of a learning atmosphere in relation to the designed activities, following the principles and established standards studied in the subject called ??Diseño curricular e instruccional de ciencias experimentales?.
- Organise and guide the process of the students, develop the activities (expositive sessions, seminars and debates, assistance to the working groups), supervise and support the learning process, especially through formative evaluation.

## 3. Assessment (1st and 2nd call)

## 4. Methodology, learning tasks, syllabus and resources

### 4.1. Methodological overview

This subject has a theoretical-practical basis. In many of the sessions, different practical cases based on textbooks, specialized literature, projects, different materials on the Internet and experienced proposals from students? creativity during these sessions will be presented, analyzed and discussed.

The practical sessions include: 1) specific activities for Biology and Geology learning (problem solving, handling of instruments, specific techniques), 2) the didactic analysis of some practical activities, 3) several outings in the urban environment close to the University, and 4) a field trip to assess the possibilities and difficulties related to this type of activity. The exits outside the classroom will take place within the school hours established for the subject.

In the same way, although in general 8 hours per week will be taught in modules of 3, 3 and 2 hours respectively, during some readjustments will be carried out during the first weeks due to the type of activities analyzed or carried out (for example, laboratory and field sessions) or the needs of the academic calendar (related to Easter holidays and practicum).

Throughout the course students will make individual and group reports, having to collect all the documentation generated in the individual portfolio of each student.

For individual or group monitoring, specific face-to-face tutorials (designs and concrete proposals) and general tutorials (email and ADD) will be proposed.

Within the page of the existing subject in the ADD, various information will be placed in the course contents to support that presented in the class sessions.

Both the script of the covered topics and the specific materials for the follow-up of the subject will be made available to students through the subject's website in the ADD of the University of Zaragoza.

## 4.2. Learning tasks

The program offered to the student to help him achieve the expected results includes the following activities:

TRAINING ACTIVITY	HOURS	PRESENTIALITY
Master classes	20	100
Problem and case solving	10	100
Labs	35	100
Special practices (field)	15	100
Works	32	10
Individual study	80	0
Assessment test	8	100

### *Lecture sessions and classroom practices:*

- Establish the main criteria for the design of activities in each of the disciplines (Biology and Geology) based on recommendations and proposals from research and innovation in Didactics of Experimental Sciences.
- Present specific types of activities in Biology and Geology and establish the mechanisms for their practical resolution (problems of genetics, cartography and geological sections, recognition of living beings, rocks and minerals, resources on the Internet, etc.) from a scientific and didactic point of view.
- Reflect and debate in groups about different methodological proposals related to the design of activities for the learning of Biology and Geology in Secondary Education.
- Prepare in groups a compilation of didactic examples for presentation and discussion in the classroom.

### *Laboratory and field activities:*

- Carry out several simple practical activities related to learning Biology and Geology (handling of microscope, elaboration of dichotomous keys, identification of specimens, cartography and geological sections, etc.)
- Carry out a field trip in the surroundings of Zaragoza to assess the educational possibilities of the area.
- Make several outings outside the classroom to work on didactic aspects of Biology and Geology (Museum of Natural Sciences, ornamental and construction rocks, park and garden plants). These activities will be carried out within the established schedule depending on the specific calendar of each course.
- Prepare different reports evaluating the activities carried out in the laboratory and in the field to transfer them into educational centers.

### *Analysis of innovative projects and materials for science classes:*

- Read and analyze different didactic proposals for the learning of Biology and Geology.
- Collecting information of the real results if the proposed activities were applied.
- Make a report on the potential of application in different contexts, foreseen difficulties, modification and / or improvement proposals.

### *Design and application of intervention proposals in the science classroom:*

- Prepare in group some activities proposals for the Secondary classroom in the disciplines involved (Biology and Geology).
- Design in group specific activities (theoretical and practical) for their possible application in the Secondary classroom.
- Differentiate the activities for the treatment of different contents and also to attend the diversity of the students.
- Present to the rest of the class the projects and activities proposed for their analysis and debate.

### *Analysis and evaluation of interventions in the classroom:*

- Present and analyze the proposal for the materials designed in the subject.
- Self-evaluation and co-evaluation of classroom proposals.

## 4.3. Syllabus

The next contents will be worked on in the different sections of the subject:

- The Biology and Geology contents and their incidence in today's society.

- Inquiry in Life and Earth Sciences.
- Approaches, active methodologies and strategies for teaching the Biology and Geology contents. Illustrative experiences and practical activities.
- Biology and Geology learning difficulties. Analysis of classroom situations and teaching resources.
- Contexts and educational relevant situations for Biology and Geology teaching.
- ICTs for teaching Biology and Geology. Internet and basic skills. Analysis of the potential value and specific limitations for the teaching-learning of the Biology and Geology contents.
- Techniques and resources for laboratory and field work. Practical laboratory activities: experiences, illustrative experiences, practical exercises and investigations.
- Questions in Biology and Geology, as a key element of a teaching by inquiry.
- Programming of the teaching of Biology and Geology. The organization of collaborative work within the framework of active methodologies.

#### **4.4. Course planning and calendar**

The approach, methodology and evaluation of this guide is prepared to be the same in any teaching scenario. They will be adjusted to the socio-sanitary conditions of each moment, as well as to the indications given by the competent authorities.

The sessions are held during the second semester when the center determine, which will be specified in advance.

The date and time of the global test will be announced in advance through the UNIZAR website and the subject in the ADD.

Other details will be specified at the beginning of the subject (presentation session) and will be announced both in the sessions and through the subject's website in the ADD.

#### **4.5. Bibliography and recommended resources**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=63238&Identificador=C71846>