

Syllabus Information

Academic Year: 2019/20

Subject: 25262 -

Faculty / School: 201 -

Degree: 571 - Degree in Environmental Sciences

ECTS: 6.0

Year: 3

Semester: Second Four-month period

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

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

- Theoretical sessions that will consist of participatory lectures.
- Practical activities that will consist of viewing videos, making problems, field trips and visits to the Agroforestry Engineering laboratory.

4.2.Learning tasks

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

- Theory sessions. Face-to-face activity in which the contents of the proposed topics will be developed. The total duration of this activity throughout the course will be 20 hours.
- Problems and cases: Face-to-face activity in which the contents of the topics proposed in theory will be practically developed. The total duration of this activity throughout the course will be 20 hours
- Practical work: 20 hours.
- Office hours: the schedule can be consulted on the EPS page.

4.3.Syllabus

THEORETICAL CONTENTS

BLOCK I: GENERALS OF GEOLOGY

Topic 1.1.- Review of basic geology concepts.

BLOCK II: BASIC PRINCIPLES OF HYDROGEOLOGY

Topic 2.1.- Porosity and hydraulic conductivity.

Topic 2.2.- Energy and Darcy's Law

Topic 2.3.- Types of aquifers. Examples Impact of overexploitation. Examples

Topic 2.3.-Piezometers, isopiezas, flow line and equipotential surfaces.

Topic 2.4. Groundwater chemistry.

BLOCK III: CAPTATION

Topic 3.1.- Analysis of springs

Topic 3.2.- Outdoor geophysics.

Topic 3.3.- Perforation: Percussion, rotation, rotopercussion. Indoor geophysics, casing and development. Installation.

Topic 3.4.- Well capacity. Pumping tests.

BLOCK IV: NUMERICAL HYDROGEOLOGY

Topic 4.1.- Laplace and Boussinesq formulas.

Topic 4.2. Thiem and Dupuit formulas. Method of the mirrors.

Topic 4.3. Theis formulas. Pumping with variation of flow. Determination of S and T by gauging. Use in semi-confined and free aquifers.

BLOCK V. CONTAMINATION OF AQUIFERS

Theme 5.1. Types. Examples Possible solutions.

Internship program:

PRACTICAL CONTENTS

Laboratory visits: Recognition of rocks. Drilling equipment, well construction materials.

Field output: Measurement of h and hydraulic gradient.

4.4.Course planning and calendar

The student must devote a total of approximately 150 hours to this subject, which must include both face-to-face and non-face-to-face activities, according to the following breakdown:

- 20 hours of theoretical classes
- 40 hours of internships
- 90 hours of autonomous work

The face-to-face sessions will be carried out according to the schedule of classes established in the School Board and which is public on the website of the Higher Polytechnic School.

Field trips are made within the EPS campus, during the course itself. They are announced in the classroom, in the previous days.

As the evaluation of this subject in case of non-attendance to 70% of the classes is by global test, the dates of the exams will be those of the official call, approved by the School Board and published on the website of the Polytechnic School Higher.

4.5.Bibliography and recommended resources

BB Fetter, C.W.. Applied hydrogeology / C.W. Fetter . 4th ed. Upper Saddle River, New Jersey : Prentice Hall, cop.2001

BB Freeze, R. Allan. Groundwater / R. Allan Freeze, John A. Cherry . Englewood Cliffs, New Jersey : Prentice-Hall, cop. 1979

The updated recommended bibliography can be consulted in:

<http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=25262&Identificador=C70936>