Course guide
2500051 - GECAIGPROV - Water Supply

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.

Degree: BACHELOR’S DEGREE IN CIVIL ENGINEERING (Syllabus 2020). (Optional subject).

Academic year: 2022  ECTS Credits: 4.5  Languages: Catalan

LECTURER

Coordinating lecturer: IVET FERRER MARTI

Others: IVET FERRER MARTI, MARIA SOLÉ BUNDÓ

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
14417. Knowledge and understanding of the supply and sanitation systems, as well as their sizing, construction and conservation. (Specific technology module: Civil Construction)
14419. Knowledge and understanding of the functioning of ecosystems and environmental factors. (Specific technology module: Hydrology)
14420. Knowledge of urban services projects related to water distribution and sanitation. (Specific technology module: Hydrology)
14421. Knowledge and understanding of the supply and sanitation systems, as well as their sizing, construction and conservation. (Specific technology module: Hydrology)

Generical:
14380. Scientific-technical training for the exercise of the profession of Technical Engineer of Public Works and knowledge of the functions of advice, analysis, design, calculation, project, construction, maintenance, conservation and exploitation.
14383. Ability to project, inspect and direct works, in their field.
14384. Capacity for the maintenance and conservation of hydraulic and energy resources, in its field.
14386. Capacity for maintenance, conservation and exploitation of infrastructure, in its field.
14389. Knowledge of the history of civil engineering and training to analyze and assess public works in particular and construction in general.

TEACHING METHODOLOGY

The course consists of 3 hours per week of classroom activity, which are devoted to: 1) theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises, and 2) solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.
LEARNING OBJECTIVES OF THE SUBJECT


1 Ability to understand the different processes that occur during water purification: coagulation, flocculation, sedimentation, filtration, adsorption, disinfection, softening or desalination.
2 Capacity for sizing a drinking water treatment station.


STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>22,5</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>63,0</td>
<td>56.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>22,5</td>
<td>20.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>4,5</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Total learning time: 112.5 h

CONTENTS

1. Legislative framework. Supply water quality

Description:

Full-or-part-time: 12h
Theory classes: 5h
Self study : 7h

2. Management of a supply system. Deposits and distribution networks

Description:

Full-or-part-time: 14h 23m
Theory classes: 6h
Self study : 8h 23m
### 3. Supply water flows

**Description:**

**Full-or-part-time:** 12h  
Theory classes: 5h  
Self study: 7h

### 4. Capture and pretreatment

**Description:**
Surface and groundwater abstraction. Roughing, sanding, pre-decanting and degreasing, sieving and pre-chlorination.

**Full-or-part-time:** 7h 11m  
Theory classes: 3h  
Self study: 4h 11m

### 5. Coagulation and flocculation

**Description:**
Basic principles, reagents and reactors used. Addition of polyelectrolytes. Flocculation test (jar test), coagulant dose. by sweeping. System sizing.

**Full-or-part-time:** 9h 36m  
Theory classes: 4h  
Self study: 5h 36m

### 6. Sedimentation

**Description:**
Basic principles, types of decanters, cleaning and extraction of the sludge generated. Surface hydraulic load. Design of decanters

**Full-or-part-time:** 7h 11m  
Theory classes: 3h  
Self study: 4h 11m

### 7. Filtration

**Description:**

**Full-or-part-time:** 9h 36m  
Theory classes: 4h  
Self study: 5h 36m
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Full-or-part-time: 7h 11m</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Softening</td>
<td>Concept of water hardness. Softening methods.</td>
<td>Theory classes: 3h  Self study : 4h 11m</td>
</tr>
<tr>
<td>12. Sludge treatment</td>
<td>Basic principles and technical means. Origin and composition of sludge. Thickening and dehydration.</td>
<td>Theory classes: 3h  Self study : 4h 11m</td>
</tr>
</tbody>
</table>
GRADING SYSTEM

The mark of the course is obtained from the ratings of continuous assessment.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

Criteria for re-evaluation qualification and eligibility: students that failed the ordinary evaluation and have regularly attended all evaluation tests will have the opportunity of carrying out a re-evaluation test during the period specified in the academic calendar. Students who have already passed the test or were qualified as non-attending will not be admitted to the re-evaluation test. The maximum mark for the re-evaluation exam will be five over ten (5.0). The non-attendance of a student to the re-evaluation test, in the date specified will not grant access to further re-evaluation tests. Students unable to attend any of the continuous assessment tests due to certifiable force majeure will be ensured extraordinary evaluation periods.

These tests must be authorized by the corresponding Head of Studies, at the request of the professor responsible for the course, and will be carried out within the corresponding academic period.

BIBLIOGRAPHY

Basic: