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 1.5 hours per week of classroom activity (large size group) and 1.5 hours weekly with half the students (medium size group).

The 1.5 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

The 1.5 hours in the medium size groups is devoted to 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.
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
8. Desalination

Description:

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

9. Adsorption

Description:

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

10. Disinfection

Description:

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

11. Softening

Description:
Concept of water hardness. Softening methods.

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

12. Sludge treatment

Description:
Basic principles and technical means. Origin and composition of sludge. Thickening and dehydration.

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

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

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.

**BIBLIOGRAPHY**

**Basic:**