

Treatment and Management of Urban and Consumer Water

Code: 102816
ECTS Credits: 6

Degree	Type	Year	Semester
2501915 Environmental Sciences	OT	4	0

Contact

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Use of Languages

Principal working language: spanish (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Other comments on languages

Part of this course will be taught in catalan

Teachers

Albert Bartroli Almera

Prerequisites

It is recommended to attend the Environmental Engineering course before attending the present one

Objectives and Contextualisation

The course will serve as an introduction to the treatment and management of urban wastewater and drinking water. At the end of the course, students will be able to understand the operation and to design the main elements of a water treatment plant. During the course, a visit to a wastewater treatment plant or a water purification plant is planned.

Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.
- Collect, analyze and represent data and observations, both qualitative and quantitative, using secure adequate classroom, field and laboratory techniques
- Demonstrate adequate knowledge and use the most relevant environmental tools and concepts of biology, geology, chemistry, physics and chemical engineering.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.

- Develop analysis and synthesis strategies regarding the environmental implications of industrial processes and urban management
- Information from texts written in foreign languages.
- Learn and apply in practice the knowledge acquired and to solve problems.
- Quickly apply the knowledge and skills in the various fields involved in environmental issues, providing innovative proposals.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Analyze, evaluate, design and operate systems or processes, equipment and facilities associated with environmental engineering in accordance with certain requirements, standards and specifications under the principles of sustainable development.
4. Apply relevant knowledge of basic sciences to enable compression, the description and the solution of typical problems of environmental engineering.
5. Apply the basic principles on which is based environmental engineering and, more specifically, mass and energy balances.
6. Apply the rules, laws and regulations pertaining to each situation.
7. Apply the scientific method to systems in which chemical, physical or biological both macroscopic and microscopic scale transformations occur.
8. Demonstrate concern for quality and praxis.
9. Demonstrate initiative and adapt to new situations and problems.
10. Design and implement waste management plans and waste water.
11. Identify the processes most appropriate to apply chemical engineering to environmental surroundings and to value them properly and originally.
12. Information from texts written in foreign languages.
13. Learn and apply in practice the knowledge acquired and to solve problems.
14. Making decisions globally considering technical, economic, social and environmental aspects.
15. Objectively compare and select different technical alternatives of an industrial process with parameters of environmental sustainability.
16. Observe, recognize, analyze, measure, and so properly and safely represent chemical engineering processes.
17. Rate structured and systematic risks to safety and health, in an existing process or design phase manner.
18. Recognize and defend the values ??of responsibility and own professional ethics of environmental engineering.
19. Recognize the role of environmental engineering in preventing and solving environmental and energy problems, according to the principles of sustainable development.
20. Teaming developing personal values regarding social skills and teamwork.
21. Work autonomously

Content

This course is divided in nine parts:

1. Introduction to the problem of wastewater
2. Water purification
3. Pipes and pumping
4. Pretreatment
5. Primary treatment
6. Secondary treatment

7. Sludge management
8. Treatment of odours
9. Tertiary treatment and potabilization

Methodology

Guided and supervised activities: Theory classes on the contents of the syllabus; Problems classes: Resolution of problems related to the subject; Group work with the students and debate about the strategies to approach and solve different problems; Elaboration of works. Group activity. Students will have to prepare a report on topics related to the subject that will be presented and defended in public; Tutorials. The teacher will be available to answer the doubts that may arise during the course.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems and cases resolution in the classroom	13	0.52	2, 3, 4, 7, 5, 13, 15, 11, 16, 12, 14, 19, 18, 21, 20, 17
Seminars and presentations	3	0.12	2, 3, 7, 5, 15, 11, 16, 19, 1, 20
Theory classes	30	1.2	2, 3, 4, 7, 5, 6, 13, 15, 9, 8, 11, 16, 12, 14, 19, 18, 1, 21, 17
Type: Supervised			
Development of theory works in group about the subject	15	0.6	2, 3, 4, 7, 5, 13, 15, 9, 8, 11, 16, 12, 19, 18, 1, 21, 20
Type: Autonomous			
Documents research	5	0.2	2, 9, 16, 12, 18, 1, 21
Mentoring	4	0.16	2, 3, 4, 5, 6, 13, 15, 9, 8, 11, 16, 19, 18, 1, 17
Problems resolution and development of works	15	0.6	2, 3, 4, 7, 5, 13, 15, 11, 16, 12, 14, 19, 21, 20
Reading of books, articles and cases	6	0.24	2, 3, 15, 16, 12, 14, 19, 21, 17
Study	49.5	1.98	2, 3, 4, 7, 5, 6, 15, 9, 11, 16, 12, 14, 19, 18, 21, 17

Assessment

The evaluation of the course will consist of two parts:

- Two partial examinations (35% each partial) that can include a part of theory and one of problems. A minimum mark of 3.5 is needed in each one of the partial tests to be able to make an average among them. Otherwise, it will be necessary to recover the failed partial in the recovery exam.
- Written work that will have to be presented orally (30%) in which some of the main units of a sewage treatment plant will be designed.

To participate in the recovery exam the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Partial 2, which includes theory and problems. Mandatory minimum of 3.5 out of 10 to make average between partials	35%	3	0.12	2, 3, 4, 7, 5, 6, 13, 15, 8, 10, 11, 16, 12, 14, 19, 18, 1, 21, 17
Written work and oral presentation (individual or in pairs): design of different units of a wastewater treatment plant	30%	3.5	0.14	2, 3, 4, 7, 5, 15, 9, 11, 16, 12, 19, 1, 20
Partial 1, which includes theory and problems. Mandatory minimum of 3.5 out of 10 to make average between partials	35%	3	0.12	2, 3, 4, 7, 5, 6, 13, 15, 8, 10, 11, 16, 12, 14, 19, 18, 1, 21, 17

Bibliography

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