

Degree	Type	Year
2504604 Environmental Sciences	OB	3

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Teachers

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Teaching groups languages

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Prerequisites

Having studied the following subjects:

- Environmental engineering
- Water science and technology
- Prevention, recycling and waste treatment

Objectives and Contextualisation

The objectives of the subject are to integrate the knowledge acquired in the previous subjects in the field of environmental technology, especially on the subject of waste water treatment, the drinking water treatment and the treatment and management of solid wastes.

Learning Outcomes

1. CM30 (Competence) Evaluate real case studies on environmental problems and conflicts.
2. CM31 (Competence) Evaluate factors related to the Sustainable Development Goals associated with a specific environmental problem.

3. CM32 (Competence) Undertake environmental projects based on real case studies, working in small groups.
4. KM40 (Knowledge) Recognise the main infrastructures and processes of water, energy and waste management in an urban environment.
5. SM38 (Skill) Incorporate the scientific, technological and social knowledge associated with a specific available problem.
6. SM39 (Skill) Apply the main techniques and elements for environmental sampling and to obtain qualitative and quantitative data relevant to environmental sciences.
7. SM40 (Skill) Critically examine public and scientific information on the environment, in relation to a specific problem.
8. SM41 (Skill) Use techniques, material and instruments related to the collection of geological and/or biological samples in the field.

Content

The content of the subject will cover different aspects of the treatment and management of urban wastewater, drinking water and solid wastes, among others. In particular, the processes and units involved in these treatments will be studied, as well as the most relevant aspects of the operation of these plants. The subject also includes the analyses of key parameters of wastewater and/or solid wastes in the laboratory as well as the writing of technical reports.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices	8	0.32	SM39, SM41
Seminars	8	0.32	CM30, CM31, CM32, KM40, SM38, SM40
Theory classes	8	0.32	CM30, CM31, CM32, KM40, SM38, SM40
Visits to facilities	26	1.04	CM30, CM31, CM32, KM40, SM38, SM39, SM40, SM41
Type: Autonomous			
Laboratory report	4	0.16	CM30, CM31, CM32, KM40, SM38, SM39, SM40, SM41
Study	82	3.28	CM30, CM31, CM32, KM40, SM38, SM40
Technical report on a study case	12	0.48	CM30, CM31, CM32, KM40, SM38, SM40

The subject consists of the following activities:

- Visits to waste and water treatment facilities to study their different configurations and operational systems. There will also be a guided visit at the UAB campus to study some innovative experiences in the field of waste, water or energy management.
- Laboratory practices in which the analysis of some key parameters of water and/or waste samples obtained during the visits will be carried out.

- Theory classes in which different case studies will be presented and also the basics for drawing up a budget and a technical report.

- Seminars that will be held prior to the visits to learn more about the processes carried out in the facilities that will be visited.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	40	1	0.04	CM30, CM31, CM32, KM40, SM38, SM40
Laboratory report	25	0	0	SM39, SM41
Technical report on a study case	35	1	0.04	CM30, CM31, CM32, KM40, SM38, SM40

The evaluation will be carried out through three different activities:

- The delivery of a report based on the results obtained in the laboratory (25%).
- The delivery and presentation of a technical report on a case study (35%).
- A theoretical exam (40%).

The non-participation in any of the assessment activities will be assessed with a zero. For a student to pass the subject through continuous assessment it is necessary to obtain a minimum mark of 2 in the exam and a 5 in the weighted average of the different activities of the subject. If grade 5 is not achieved globally, the student may undergo a resit exam. In this case, the marks of the laboratory report and the technical report will remain unchanged.

Without prejudice to other disciplinary measures, and in accordance with current academic regulations, any irregularities committed by the student that could lead to a variation of the score of an evaluation act will be marked with a zero. Therefore, copying or allowing to copy in an evaluation activity will imply a zero (0).

If the technical report is not submitted or the laboratory practices are not attended, the students will be classified as "NOT EVALUABLE", regardless of the grade of the midterm exams.

Bibliography

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- N.P. Chermisnoff. Handbook of Water and Wastewater Treatment Technologies. Butterworth-Heinemann. Boston. 2002
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- M.L. Davis, D.A. Cornwell. Introduction to Environmental Engineering, 5th Ed. McGraw Hill Inc. Editions. New York. 2008.
- C. Kennes, M.C. Veiga. Air Pollution Prevention and Control: Bioreactors and Bioenergy John Wiley & Sons Inc., Chichester. 2013.
- C. Menéndez-Gutiérrez, J.M. Pérez-Olmo. Procesos para el Tratamiento Biológico de Aguas Residuales Industriales. Ed. Universitaria. La Habana. 2007.
- Metcalf & Eddy, Inc. Wastewater Engineering: Treatment and Reuse. McGraw-Hill Inc. Editions. Boston. 2003.
- H.S. Peavy, D.R. Rowe, G. Tchobanoglous. Environmental Engineering. McGraw Hill Inc. Editions. N.Y. 1985.
- R.S. Ramalho. Tratamientos de Aguas Residuales. Editorial Reverté. Barcelona. 1993.
- M.C.M. van Loosdrecht, P.H. Nielsen, C.M. López-Vázquez, D. Brdjanovic. Experimental Methods in Wastewater Treatment. IWA Publishing. London. 2016
- *Gestión integral de residuos sólidos*. George Tchobanoglous, Hilary Theisen, Samuel A. Vigil. Editorial Mc Graw-Hill. 1994
- The Practical Handbook of Compost Engineering. R. T. Haug. Editorial CRC Press. 1993. (Disponibile document electrònic: <https://ebookcentral.proquest.com/lib/uab/detail.action?docID=5389526>)
- Agència de Residus de Catalunya, www.arc.cat

Software

It is not required a specific software.

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	3	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	4	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	1	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	2	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	3	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	4	Catalan/Spanish	second semester	morning-mixed
(TE) Theory	1	Catalan/Spanish	second semester	morning-mixed