

29937 - Waste Management and Environmental Impact

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Course	4
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

This subject includes theory and practice and its learning process is based on 2.4 ECTS of work done in-person (60 hours), and 3.6 ECTS (90 hours) of self-guided study and work group. The programmed activities are detailed below.

The class presentations, work group and laboratory instructions are available for the students at the subject website (Moodle platform) that can be found at <http://moodle2.unizar.es/add/> .

5.2.Learning activities

29937 - Waste Management and Environmental Impact

On-site activities: 2.4 ECTS, 60 hours

1. Classroom based sessions (TP1): 30 hours, 2 per week. Sessions with theoretical and practical contents. The units are presented encouraging class participation, reflexive and proactive attitudes.
2. Problem solving and case studies (TP2): 15 hours, 1 per week. Exercises and case studies will be done in order to complement theoretical sessions. The student should work on the preparation of these case studies previously, and participate in class.
3. Laboratory and simulation sessions (TP3): 10 hours divided in 5 sessions of 2 hours each. The student will develop practical skills related to waste management, either based on simulation software or in laboratory work. The student should read the instructions for each sessions previously and be able to hand in the required report at the end of each session.
4. Evaluation (TP8): 5 hours. Besides obtaining a mark, evaluation is one of steps of the learning process, where the students can check their degree of understanding of the presented concepts and their acquirement of the required competencies.

If possible, some visits to waste management facilities will be planned during the semester. These visits are voluntary for the students. Attendance will account for approximately 5 hours of non on-site activities.

Non on-site activities: 3.6 ECTS, 90 horas.

1. Study (TP7): 80 hours. Includes study and problem solving. Continuous work by the student will be encouraged. Tutorials are also included in this section.
2. Work group (TP7): 10 hours. Includes the development of a subject related to waste management in groups of 2-3 persons.

5.3.Program

Module 1. Waste management

Unit 1.1. Introduction, General concepts

Unit 1.2. Integral waste management. Management of hazardous wastes

Unit 1.3. Waste minimization

Unit 1.4. Recovery materials facilities

Unit 1.5. Advanced technologies for recycling

Unit 1.6. Advanced biological treatments for wastes

Unit 1.7. Advanced thermal treatments for wastes

Unit 1.8. Advanced concepts of landfilling

29937 - Waste Management and Environmental Impact

Unit 1.9. Management of urban WWTP sludges

Module 2. Environmental impact assessment (EIA)

Unit 2.1. Introduction to Environmental Impact Assessment.

Unit 2.2. Impact Assessment. Concept and features.

Unit 2.3. Administrative procedure of environmental impact assessment

Unit 2.4. The environmental impact study.

Laboratory sessions:

Lab session nº 1. Design and control of a composting process of urban wastes (I)

Lab session nº 2. Management of industrial wastes (I)

Lab session nº 3. Management of industrial wastes (II)

Lab session nº 4. Thermal treatments of wastes

Lab session nº 5. Design and control of a composting process of urban wastes (II)

5.4.Planning and scheduling

Planning (summary):

- Classroom based sessions (TP1). 30 hours total (2 per week)
- Problem solving and case studies (TP2). 15 hours total (1 per week)
- Laboratory and computer sessions (TP3). 10 hours total (5 sessions, 2 hours each)
- Evaluation (TP8): 5 hours total.
- Home study (TP7): 80 hours estimated.
- Work group (TP7): 10 hours estimated.

5.5.Bibliography and recommended resources

29937 - Waste Management and Environmental Impact

BB Elias Castells, Xavier. Reciclaje de residuos industriales : aplicación a la fabricación de materiales para la construcción / Xavier Elias Castells Madrid : Díaz de Santos, D.L. 2000

BB Tchobanoglous, George. Gestión integral de residuos solidos / George Tchobanoglous, Hilary Theisen, Samuel Vigil ; traducción y revisión técnica Juan Ignacio Tejero Monzón, José Luis Gil Díaz, Marcel Szanto Narea . - [1a. ed. en español] Madrid [etc.] : McGraw-Hill, D.L.1994

BB Evaluación de impacto ambiental / Alfonso Garmendia Salvador...[et al.] Madrid [etc.] : Pearson/Prentice Hall, cop. 2005.

BB Conesa Fernández-Vítora, Vicente. Guía metodológica para la evaluación del impacto ambiental / Vicente Conesa Fdez.-Vítora ; colaboradores, Vicente Conesa Ripoll, Luis A. Conesa Ripoll ; prólogos de María Teresa Estevan Bolea . - 4ª ed. Madrid: Mundi-Prensa, 2010