28774 - Waste Management and Debugging Techniques. Civil Constructions

Información del Plan Docente

Academic Year	2017/18
Faculty / School	175 - Escuela Universitaria Politécnica de La Almunia
Degree	423 - Bachelor's Degree in Civil Engineering
ECTS	6.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain

degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The current subject is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, the solving of problems or resolution of questions and laboratory work, at the same time supported by other activities

The organization of teaching will be carried out using the following steps:

— **Theory Classes** : Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.

— **Practical Classes** : The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.

— **Laboratory Workshop** : The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.

— **Individual Tutorials** : Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

5.2.Learning tasks

The programme offered to the student to help them achieve their target results is made up of the following activities...

Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

— **Face-to-face generic activities** :

● **Theory Classes** : The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.

● **Practical Classes** : Problems and practical cases are carried out, complementary to the theoretical concepts studied.

● **Laboratory Workshop** : This work is tutored by a teacher, in groups of no more than 20 students.

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— **Generic non-class activities** :

● Study and understanding of the theory taught in the lectures.

● Understanding and assimilation of the problems and practical cases solved in the practical classes.

● Preparation of seminars, solutions to proposed problems, etc.

● Preparation of laboratory workshops, preparation of summaries and reports.

● Preparation of the written tests for continuous assessment and final exams.

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the subject file in the Accreditation Report of the degree, taking into account the level of experimentation considered for the said subject is moderate.

Activity	Weekly school hours
Lectures	3
Laboratory Workshop	1
Other Activities	6

Nevertheless the previous table can be shown into greater detail, taking into account the following overall distribution:

— 40 hours of lectures, with 50% theoretical demonstration and 50% solving type problems.

— 10 hours of laboratory workshop, in 1 or 2 hour sessions.

— 6 hours of written assessment tests, one hour per test.

— 4 hours of PPT presentations.

— 90 hours of personal study, divided up over the 15 weeks of the 2 nd semester.

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There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

5.3.Syllabus

The syllabus of the course is developed around the following thematic blocks:
Topic 1
Introduction
1.1. Definitions and Terminology
1.2. Minimization
1.3. Recovery or recovery
1.4. Safe treatment. Destruction
1.5. Deposition
Topic 2
Generation and waste management
2.1. Law regulating waste in Spain
2.2. European Waste Catalogue
2.3. Generation and waste management in Aragón
2.4. Manual industrial waste management in Aragón and management systems
2.5.-Management packages
Topic 3
3.1. Energy recovery systems
3.2. energy content of waste
3.3. Environmental impact
3.4. Energy Recovery Systems
3.5 Legislation
Topic 4
Biological treatments: anaerobic digestion
4.1. Introduction to biological treatments
4.2. Anaerobic digestion process
4.3. Digestion products methanogenic
4.4. Types of reactors for anaerobic digestion
Topic 5
Biological treatment: Composting
5.1. Introduction
5.2. Process conditions
5.3. Transformations during composting
5.4. Variation of physico-chemical parameters throughout treatment
5.5 Parts of a composting plant
5.6. Materials and out of a composting plant
5.7. Previous calculations.
Topic 6
Demolition and construction waste.
6.1 Types of waste
6.2.- Management RCD's
Topic 7
Separation and recovery of materials
7.1. Separation technologies solids
7.2. Solid-liquid separation technologies.
7.3. Valorization of various materials
2. PRACTICAL CONTENTS.
Each topic discussed in the previous section, carries associated practical exercises on real cases of application in several companies: engineering, industry and the free exercise of the profession.

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5.4.Course planning and calendar

The dates of the final exams will be those that are officially published at http://www.eupla.es/secretaria/academica/examenes.html.

The planning orientation shown below

— **Week 1 and 2** : Topic 1.

— **Week 3, 4 and 5** : Topic 2.

— **Week 6, 7 and 8** : Topic 3.

— **Week 9 and 10** : Topic 4.

— **Week 11 and 12** : Topic 5.

— **Week 13** : Topic 6.

— **Week 14 and 15** : Topic 7.

5.5.Bibliography and recommended resources

Bibliography

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- Vega de Kuyper, Juan Carlos. Manejo de residuos de la industria química y afín / Juan Carlos Vega de Kuyper. - 2ª ed México, D.F. : Alfaomega, cop. 1999

Resources

Material	Format
Topic theory notes	Paper/repository
Topic problems	
Topic theory notes	Digital/Moodle
Topic presentations	E-Mail
Topic problems	
Related links	
Educational software	Web page