28759 - Sanitary Engineering

Información del Plan Docente

Academic Year	2016/17
Academic center	175 - Escuela Universitaria Politécnica de La Almunia
Degree	423 - Bachelor's Degree in Civil 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

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 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.

— **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.

5.3.Program

Topic 1 Water. Properties, physico-chemical characteristics
Topic 2. The water cycle and its interaction with the environment
Topic 3 Regulations
Topic 4 Water Microbiology
Topic 5 Introduction to debug systems
Topic 6 Activated sludge. Water line. pretreatment
Topic 7 Activated sludge. Water line. Primary treatment
Topic 8 Activated sludge. Water line. Secondary treatment
Topic 9 Activated sludge. Water line. tertiary treatment
Topic 10 Activated sludge.
Topic 11 biological filters, trickling filters, biodiscs
Topic 12 Green Filters
Topic 13 Water Purification
Topic 14 Reuse treated water

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. During this course practical activities consist of the following will take place:
1. Determination of various physico-chemical parameters of water.
2. Determination of BOD
3. Technical visits to EDAR and ETAP

5.4.Planning and scheduling

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, 2 and 3** : Topic 1.

28759 - Sanitary Engineering

— **Week 4** : Topic 2.

— **Week 5** : Topic 3.

— **Week 6** : Topic 4.

— **Week 7** : Topic 5.

— **Week 8** : Topic 6.

— **Week 9** : Topic 7.

— **Week 10** : Topic 8.

— **Week 11** : Topic 9.

— **Week 12** : Topic 10.

— **Week 13** : Topic 11.

— **Week 14 and 15** : Topic 12.

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

28759 - Sanitary Engineering

5.5.Bibliography and recomended resources

- LaGrega, Michael D.. Gestión de residuos tóxicos : Tratamiento, eliminación y recuperación de suelos / Michael D. LaGreca, Phillip L. Buckingham, Jeffrey C. Evans Madrid : McGraw-Hill, D.L. 1996
- Seoánez Calvo, Mariano. Aguas residuales urbanas : tratamientos naturales de bajo costo y aprovechamiento / Mariano Seoánez Calvo ; con la colaboración de Irene Angulo Aguado . - 2a. ed. Madrid[etc.] : Mundi-Prensa : Análisis y Trabajos Prospectivos, 1999
- Seoánez Calvo, Mariano. Ingeniería del medio ambiente : aplicada al medio natural continental : la contaminación del medio natural continental: aire, aguas, suelos, vegetación y fauna. Tecnologías de identificación, lucha y corrección : manual técnico para el empresario, el ingeniero, el gestor medioambiental y el enseñante / Mariano Seoánez Calvo ; con la colaboración especial de Irene Angulo Aguado y del equipo de expertos coordinado por el Dr. Seoánez . - 2ª ed. rev. Madrid [etc] : Mundi-Prensa, 1999
- Ingeniería sanitaria : tratamiento, evacuación y reutilización de aguas residuales / Metcalf & Eddy Inc. ; traducción Juan de Dios Trillo Montsoriu, con la colaboración de Nilo Lletjós Masó . - 2a. ed / revisada por George Tchobanoglous Barcelona : Labor, 1985
- Ingeniería de aguas residuales : tratamiento, vertido y reutilización / Metcalf and Eddy ; revisado por George Tchobanoglous, Franklin L. Burton ; traducción y revisión técnica, Juan de Dios Trillo Montsoriu, Ian Trillo Fox ; prólogo de Angel Cajigas . - 3a. ed., [reimpr.] Madrid [etc.] : McGraw-Hill, D.L. 2000
- Water treatment = tratamientos de aguas = tractaments d'aigües / Stenco ; [J. Mª Martí Deulofeu ; coordinación, Sergi Martí] . - [3a. ed.] Barcelona : [Stenco], D.L. 2004
- Hernández Muñoz, Aurelio. Manual de depuración Uralita : sistemas para depuración de aguas residuales en núcleos de hasta 20.000 habitantes / Aurelio Hernández Muñoz, Aurelio Hernández Lehmann, Pedro Galán Martínez . - [1ª ed.] Madrid : Paraninfo : Uralita Productos y Servicios, 1995

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