

Información del Plan Docente

Academic Year	2016/17
Academic center	179 - Centro Universitario de la Defensa - Zaragoza
Degree	563 - Bachelor's Degree in Industrial Organisational Engineering
ECTS	4.5
Course	2
Period	Second semester
Subject Type	Compulsory
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**

The learning process designed for this subject is based on the development of theoretical-practical activities focused on environment pollution. The particular contents described in the verified manuscript of the degree and the corresponded credits are patented in these activities. The aim of these activities is to provide student with the expected learning outcome and the habits which help them in their professional and personal life.

5.2.Learning activities

The teaching methodology consist of next active learning activities: lectures, practical sessions, problem-based learning,

seminars, exams and finals. These activities could be complemented with others like problem solving tasks, mini-project work and lab reports redaction and the personal study.

Through the Moodle platform the professoriate makes the activities program accessible for the students with its corresponded username and password in the web site <http://moodle.unizar.es>

5.3.Program

Topic 1. Engineering concepts applied to the environment

1.1. Introduction to engineering calculations

1.2. Mass balances

1.3. Fluid flow concepts

1.4. Separation processes

Topic 2. Water pollution

2.1. Introduction

2.2. Pollulants and its characterization

2.3. Depuration treatments

Topic 3. Atmospheric pollution

3.1. The atmosphere

3.2. Air pollution

3.3. Atmospheric pollution control

Topic 4. Waste pollution

4.1. General concepts and properties of the waste

4.2. Waste treatments

Topic 5. Environmental Management System (EMS)

5.1. Introduction

5.2. EMS Planning: identification and quantification of aspects and impacts in the environmental

5.3. EMS Planning: Air pollutants and waste identification and classification

5.4. Conclusions

5.4. Planning and scheduling

Deadlines for the presentation of different reports or solved-problems carried out along the course will be show on Moodle platform or during the lectures. More information about dates and schedules could be found in the Centro Universitario de la Defensa web site: <http://cud.unizar.es> .

During the course, audio-visual and paper-based materials will be used. These material will be available early enough in the Moodle platform.

5.5. Bibliography and recommended resources

- 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. rev. y amp. Madrid: Mundi-Prensa, 2010
- Contaminación ambiental : una visión desde la química / Carmen Orozco Barrenetxea... [et al.] Madrid [etc.] : Thomson, D. L. 2002
- Evaluación de impacto ambiental / Alfonso Garmendia Salvador... [et al.] . - reimp. Madrid : Pearson Educacion, 2005 (reimp. 2008)
- Flores, R.C., Herrera, L., Hernández, V. Ecología y medio ambiente. Cengage Learning Editores, 2008
- Gestión ambiental. AENOR, 2006
- Gómez Orea, Domingo. Consultoría e ingeniería ambiental : planes, programas, proyectos, estudios, instrumentos de control ambiental, dirección y ejecución ambiental de obra, gestión ambiental de actividades / Domingo Gómez Orea, Mauricio Gómez Villarino Madrid : Mundi-Prensa, 2007
- Handbook of solid waste management / [editors] George Tchobanoglous, Frank Kreith . - 2nd ed. New York [etc.] : McGraw Hill, cop. 2002
- Henry, J. Glynn. Ingeniería ambiental / J. Glynn Henry y Gary W. Heinke ; Con la participación de... Ian Burton...[et al.] Mexico : Prentice-Hall, cop. 1999
- 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. Madrid [etc.] : McGraw-Hill, D.L. 1995
- LaGrega, Michael D. Gestión de residuos tóxicos : Tratamiento, eliminación y recuperación de suelos / Michael D. LaGrega, Phillip L. Buckingham, Jeffrey C. Evans Madrid : McGraw-Hill, D.L. 1996
- Medina de Lemus M. Medio ambiente: protección y responsabilidad. Diles, 2007
- Mihelcic, J.R., Zimmerman, J.B. Environmental Engineering. Fundamentals, sustainability, design. Wiley, 2010
- Nevers, Noel de. Ingeniería de control de la contaminación del aire / Noel de Nevers ; traducción, José Hernán Pérez Castellanos . - [1ª ed. en español] México [etc.] : McGraw-Hill, cop. 1998
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- Wark, Kenneth. Contaminación del aire : origen y control / Kenneth Wark , Cecil F. Warner . - [Reimp.] México D. F. : Limusa, cop. 2006