



COURSE GUIDE 2024/25

Faculty 310 - Faculty of Science and Technology

Cycle .

Degree INQUI15b - Master in Chemical Engineering

Year .

COURSE

504270 - Waste valorisation

Credits, ECTS: 3

COURSE DESCRIPTION

The Waste Valorization course deals with the analysis of the problems of industrial waste, as well as its characterization, and decision-making about its management. It deals with the evaluation of the state of the art and the development of the available technologies for waste valorization.

It considers the use of alternatives to waste minimization and valorization to solve practical problems and the application of waste valorization processes to practical cases of waste generation.

In order to expand training in energy and waste, it is recommended to study the optional subject of the university Master's Degree in Chemical Engineering "Remediation of Contaminated soils".

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

COMPETENCIAS DE LA ASIGNATURA

Understand the problem of industrial waste, as well as, characterize it, and make decisions about its management.

Evaluate the state of the art and the development of available technologies for waste valorization.

Analyze alternatives to waste minimization and valorization to solve practical problems.

Apply waste valorization processes to practical cases of waste generation.

RESULTADOS DE APRENDIZAJE DE LA ASIGNATURA

After studying the subject, students will be able to:

- Analyze and interpret the application of current legislation on waste and characterization of industrial waste
- Identify and describe the main industrial waste valorization processes
- Select the most appropriate management among the alternatives for the minimization and valorization of specific waste in accordance with current legislation

Theoretical and Practical Contents

Topic 1. Urban and industrial waste. Current legislation on waste. Types of waste, management and waste treatment.

Topic 2. Valorization processes of waste biomass, industrial sludge and waste from polluted soil. Application of valorization processes.

Topic 3. Processes for valorization of waste plastics. Application of valorization processes.

Topic 4. Processes for valorization of end-of-life tyres. Application of valorization processes.

METODOLOGIA (ACTIVIDADES FORMATIVAS)

Actividad Formativa	Hours	Porcentaje presencialidad
Expositive classes	13	100 %
Case analysis	15	40 %
Handling sources and resources	22	0 %
Exercises	25	44 %

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	13	6	5		6				
Horas de Actividad No Presencial del Alumno/a	18	9	9		9				

Legend: M: Lecture-based S: Seminar GA: Applied classroom-based groups
 GL: Applied laboratory-based groups GO: Applied computer-based groups GCL: Applied clinical-based groups
 TA: Workshop TI: Industrial workshop GCA: Applied fieldwork groups

Evaluation tools and percentages of final mark

Denominación	Ponderación mínima	Ponderación máxima
Presentations	30 %	70 %
Practical tasks	30 %	70 %

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

Abstracts, reports, and presentations tasks: 70-80%



Tasks of questions in a fixed time: 20-30%

The assessment guidelines in this subject are based on the documents: "Regulatory Regulations for Student Assessment in Official Undergraduate Degrees" and "Protocol on Academic Ethics and Prevention of Dishonest or Fraudulent Practices in Assessment Tests and Academic Papers at the UPV/EHU" (<https://www.ehu.eus/es/web/estudiosdegrado-graduakoikasketak/akademia-araudiak>)"

REQUESTING FOR FINAL ASSESSMENT SYSTEM

Students who want to be assessed by the final assessment system, regardless of their participation in the continuous assessment, will have to submit a written resignation to continuous evaluation, filling in the form available in egela of the VR subject and uploading the completed form through the VR subject in egela, for which they will have a period of 9 weeks (weeks 1 to 9 of the semester), according to the academic calendar of the center. (Art. 8.3 Text approved in the Degree Committee of May 16, 2019).

Resignations will NOT be accepted by other means, nor after the deadline.

RESIGNATION TO THE CALL

Both in the case of continuous and final assessment, since the weight of the final exam of the subject "Waste valorization" is greater than 40% of the subject's grade, it will be sufficient not to go to the final exam so that the final grade of the subject is << not presented >>. (Art. 12.2 Text approved in the Degree Committee of May 16, 2019 and applicable in 2019/20)

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

ASSESSMENT:

Assessment proof/final exam 100% of the total

The assessment guidelines in this subject are based on the documents: "Regulatory Regulations for Student Assessment in Official Undergraduate Degrees" and "Protocol on Academic Ethics and Prevention of Dishonest or Fraudulent Practices in Assessment Tests and academic papers at the UPV/EHU" (<https://www.ehu.eus/es/web/estudiosdegrado-graduakoikasketak/akademia-araudiak>)"

RESIGNATION TO THE CALL

It is sufficient not to go to the extraordinary exam, so that the final grade of the subject is << not presented >>.

MANDATORY MATERIALS

Course notes and basic bibliography

BIBLIOGRAPHY

Basic bibliography

- LaGrega, M.D., Buckingham, P.L., Evans, J.C., 1996. Gestión de residuos tóxicos. Tratamiento, eliminación y recuperación de suelos. McGraw-Hill Interamericana.
- Marañón, E. Residuos industriales y suelos contaminados. 2000, Servicio de publicaciones, U Oviedo, Oviedo.

Detailed bibliography

- Aguado, J., Serrado, D., Feedstock Recycling of Waste Plastics, Royal Society of Chemistry, 1999
California Integrated Waste Management Board, Environmental Factors of Waste Tire Pyrolysis, Gasification, and Liquefaction, 1995.
Curlee, T.R., Das, S., Plastic Wastes. Management, Control, Recycling, and Disposal, US Environmental Protection Agency, 1991.
Scheirs J. Kaminsky, W. Feedstock Recycling and Pyrolysis of Waste Plastics,, Wiley, 2006
Klass, D.L., Biomass for Renewable Energy, Fuels, and Chemicals, Academic Press, 1998.

Journals

Environmental Science and Technology, Chemical Engineering Science, Fuel, Energy and Fuels, Industrial and Engineering Chemistry Research, Waste Management, Energy Conversion and Management, ¿

Web sites of interest

www.epa.gov/osw/
[http://www.ibet.pt/Industry/
Water_energy_and_the_environment/Waste_valorization.htm](http://www.ibet.pt/Industry/Water_energy_and_the_environment/Waste_valorization.htm)