



## Course guides

# 33115 - GTR - Waste Management and Treatment

Last modified: 05/05/2020

**Unit in charge:** Manresa School of Engineering  
**Teaching unit:** 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

**Degree:** MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING (Syllabus 2015). (Compulsory subject).

**Academic year:** 2020    **ECTS Credits:** 5.0    **Languages:** Spanish

### LECTURER

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**Coordinating lecturer:** Bonsfills Pedros, Anna

**Others:** Busquets Rubio, Pere

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

1. The ability to understand the types of waste that may be generated from natural resources and apply the most appropriate approaches to management and treatment.

### TEACHING METHODOLOGY

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Lectures, which cover the topics related to the specific learning objectives. Exercises and introduction to research tasks, which students must do and hand in and which form part of continuous assessment.

Two individual written tests are set during the semester. Parts of the tests are multiple-choice and the other parts involve solving problems.

### LEARNING OBJECTIVES OF THE SUBJECT

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- 1.To gain a broad understanding of the management and treatment of solid, liquid and gaseous waste from extractive activities and of the effect of pollutants on these activities, with an emphasis on heavy metals.
- 2.To contribute to waste minimisation at source, the use of waste during the manufacturing process and the recycling and recovery of materials whose useful life has ended.
- 3.To give as much value as possible to waste, following sustainability criteria.
- 4.To apply the knowledge acquired in simple research tasks.

### STUDY LOAD

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Type	Hours	Percentage
Hours large group	30,0	66.67
Hours medium group	15,0	33.33

**Total learning time:** 45 h



## CONTENTS

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### DESCRIPTION

**Description:**

- 1.Introduction
- 2.Characterisation of waste
- 3.Management of industrial waste
- 4.Industrial waste treatment systems
- 5.Building and mining waste
- 6.Metal mining waste
- 7.Non-metal and potash mining waste
- 8.Radioactive waste

**Full-or-part-time:** 50 h

Theory classes: 30h

Practical classes: 20h

## GRADING SYSTEM

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The final mark is calculated by applying the following percentages:

Continuous assessment activities 30%

Individual written test I (multiple-choice and problems) 35%

Individual written test II (multiple-choice and problems) 35%

## BIBLIOGRAPHY

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**Basic:**

- Gil, Manel, i altres. De residu a recurs: 20 anys de gestió de residus a Catalunya. Barcelona: Clipmèdia Edicions. Generalitat de Catalunya, Departament de Territori i Sostenibilitat: Agència de Residus de Catalunya, 2013. ISBN 9788494184000.
- Pérez Dueñas, Lara, i altres. Guía de caracterización de residuos peligrosos. Bilbao: Atregus, 2008. ISBN 9788461229628.
- Lagrega, Michael D.; Buckingham, Phillip L.; Evans, Jeffrey C. Gestión de residuos tóxicos: tratamiento, eliminación y recuperación de suelos. Madrid: McGraw-Hill, 1996. ISBN 8448107128.
- Aguado Alonso, José, i altres. Los residuos peligrosos: caracterización, tratamiento y gestión. Madrid: Síntesis, 1999. ISBN 8477387036.
- Elías Castells, Xavier, dir. Tratamiento y valorización energética de residuos. Madrid: Díaz de Santos, 2005. ISBN 8479786949.
- Tchobanoglous, George; Theisen, Hilary; Vigil, Samuel. Gestión integral de residuos sólidos. Madrid: McGraw Hill, 1994. ISBN 8448118308.
- Panorama minero [on line]. Madrid: Instituto Geológico y Minero de España, 1981- [Consultation: 15/01/2018]. Available on: <http://www.igme.es/panoramaminero/pmlin.htm>.