Waste Management

Code: 42408
ECTS Credits: 6

<table>
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<tr>
<th>Degree</th>
<th>Type</th>
<th>Year</th>
<th>Semester</th>
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<tr>
<td>4313784 Interdisciplinary Studies in Environmental, Economic and Social Sustainability</td>
<td>OT</td>
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<td>1</td>
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</tbody>
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Contact

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Email: Teresa.Gea@uab.cat

Teachers

Cristina Sendra Sala

Prerequisites

No specific knowledge required.

Objectives and Contextualisation

Provide the knowledge needed to manage waste as a resource, energy saving and reduction of greenhouse gas emissions (GHG).

Skills

- Analyse, summarise, organise and plan projects related to the environmental improvement of product, processes and services.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Work in an international, multidisciplinary context.

Learning outcomes

1. Choose and propose the most sustainable waste management system under current legislation and the objectives of international policies.
2. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
3. Estimate greenhouse gas emissions attributable to waste.
4. Estimate the main environmental impacts of waste management systems, whether urban, industrial or agricultural.
5. Quantify the chances of reducing environmental impacts and GHG on the basis of new technologies, methodologies and waste management systems.
6. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
7. Work in an international, multidisciplinary context.

Content

Block 1 Unit operations for the use of waste as raw materials and emissions of greenhouse gases (GHG).
- Recyclable materials: plastic, glass, paper and cardboard, cans, batteries and accumulators. Organic matter. Other recyclable materials.
- Recycling plants. Eco-parks and Recovery areas.
- Landfills and estimation of their emissions.

Block 2 Indicators.
- GHG quantification methodologies for the waste sector (IPCC, LCA ...)
- Emissions generated and/or reduced due to waste management that affects other sectors: transport, industry, energy, CO2 credits
- Saving energy and material recycling and recovery of materials and energy.
- Software modeling and measurement: LCA study, CO2 equivalent calculator, Landgem ....

Block 3 Sustainable management of urban, agricultural and industrial waste

- Applying Industrial Ecology tools (industrial symbiosis, flows exchanging, MFA, LCA Exegetic Analysis, Ecodesign, carbon footprint, ....) for designing innovative and sustainable system for waste management.

Methodology

Lectures/oral expositions
Classroom practices
Seminars
Preparation of reports
Autonomous activity
Reading reports/papers of interest

Activities

<table>
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<tr>
<th>Title</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning outcomes</th>
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<tr>
<td>Lectures</td>
<td>36</td>
<td>1.44</td>
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Type: Directed

Type: Supervised
Evaluation

Students must submit essays or reports which will be prepared as a group or individually. Some works can be presented / discussed in class (50%).
Written exam (50%).

The minimum mark required for each item is 40% for obtaining the final mark.

Evaluation activities

<table>
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<tr>
<th>Title</th>
<th>Weighting</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning outcomes</th>
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<tr>
<td>Delivered reports and oral presentations</td>
<td>50 %</td>
<td>12</td>
<td>0.48</td>
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<td>Exams</td>
<td>50 %</td>
<td>2</td>
<td>0.08</td>
<td>1, 4, 3, 5</td>
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Bibliography

- Materiales del campus virtual de la UAB. (intranet UAB, campus virtual)
- MECOSIND. (intranet UAB, campus virtual)
- Perry's Chemical engineer's handbook. (section 26-31).
- ISO 14040 Environmental management - Life cycle assessment - Principles and framework - 1998
• ISO 14042: Environmental management - Life cycle assessment - Life cycle impact assessment - 2000
• ISO 14043: Environmental management - Life cycle assessment - Life cycle interpretation - 2000
• SimaPro 4.0 Database - PRé Consultants B.V. , Amersfoort (The Netherlands)

WEBs

CARBON FOOTPRINT TOOL OF WASTE MANAGEMENT IN EUROPE
http://co2zw.eu.sostenipra.cat/

Sustainable Design de la University of Surrey. www.cfsd.org.uk

Compra verde www.uab.cat/compraverda

O2 www.o2.org

Center for Design de la RMIT University (Austràlia)
www.cfd.rmit.edu.au

Centre de Recursos Barcelona Sostenible
www.bcn.es/agenda21/crbs/

Agence de l'Environnement et de la Maîtrise de l'Energie francesa. Productos reciclados
www.produits-recyles.com/

The EcoDesign Fundation (Sidney, Austràlia)
www.edf.edu.au/

Guía de ecodiseño UNEP
design.ntnu.no/fag/ecodesign/theory/theory_frames.htm

Grupo sostenibilidad y prevención ambiental. SOSTENIPRA
www.sostenipra.cat