250670 - INDALIMEMA - Food Industry and Environment

Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit: 745 - EAB - Department of Agri-Food Engineering and Biotechnology
Academic year: 2015
Degree: MASTER'S DEGREE IN ENVIRONMENTAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: MERCÈ RAVENTOS SANTAMARIA
Others: MERCÈ RAVENTOS SANTAMARIA

Opening hours
Timetable: Before and after classes.
Contact: merce.raventos@upc.edu

Teaching methodology
The subject has continuous assessment. Begins with theoretical classes of 3 hours when the teacher explains the concepts, methodology, work plan and basic materials of the matter.

As the course progresses, there is a greater interaction and participation of the students. There are case studies in order to consolidate General and specific learning objectives.

Learning objectives of the subject
CE01 - Apply scientific concepts to environmental problems and their correlation with technological concepts.
CE08-Dimension unconventional systems and advanced treatment and raise their mass balance and energy.

Explore scientific concepts and technical principles of quality management of the receiving means, atmosphere, water and soil, and applied to problem solving.
Explore scientific concepts and technical principles of management and treatment of gaseous emissions, water supply, sewage and waste and remediation techniques for groundwater and contaminated soils.
Sized systems for the treatment of major pollutants vectors in specific sectors of activity.
Interprets rules, identifies goals, assesses technical alternatives proposed unconventional solutions and priority actions.

Aspects of food production and industrialization.
Unit processes in the food industry.
Emerging Technologies for the food industry: APH, HIPEF, ESC, irradiation, membrane technologies,...
Processing waste from the food industry.
Case studies.

Fundamental concepts of food processing and specificity of this important sector. Justify the new processes and products with emphasis on environmental aspects.
## Study load

<table>
<thead>
<tr>
<th>Study load</th>
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<tbody>
<tr>
<td><strong>Total learning time:</strong></td>
<td>125h</td>
<td></td>
</tr>
<tr>
<td>Theory classes:</td>
<td>15h</td>
<td>12.00%</td>
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<tr>
<td>Practical classes:</td>
<td>10h</td>
<td>8.00%</td>
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<tr>
<td>Laboratory classes:</td>
<td>10h</td>
<td>8.00%</td>
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<tr>
<td>Guided activities:</td>
<td>10h</td>
<td>8.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>80h</td>
<td>64.00%</td>
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## Content

### Unit processes most important for the food industry

**Description:**
Production and industrialization of food. Background importants.

**Specific objectives:**
Identify the most important unit processes for the food industry and the basic principles that govern them.

**Learning time:** 28h 47m
- Theory classes: 9h
- Laboratory classes: 3h
- Self study: 16h 47m

### Technical innovations applied to processed foods

**Description:**
Technical innovations applied to food processing.
Specific applications of emerging techniques in various sectors of the food industry.

**Specific objectives:**
Get the possibilities of applying an emerging technology to a concrete food industry justifying its use, especially the environmental point of view.

**Learning time:** 28h 47m
- Theory classes: 9h
- Laboratory classes: 3h
- Self study: 16h 47m

### Waste treatment in the food processing industry

**Description:**
We propose a flowchart duly justified treatment of waste effluents or a particular sector of the food industry that is considered more appropriate.
Propose a flowchart, justified, for the treatment of waste effluents for a particular sector of the food industry.

**Specific objectives:**
Explain and justify the best solution proposed to treat the waste or effluent from a particular food industry.

**Learning time:** 36h
- Theory classes: 6h
- Practical classes: 9h
- Self study: 21h
The mark of the course is obtained from the ratings of continuous assessment.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom). The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

If any of the continuous assessment activities is not performed at the scheduled time, a final global exam will be needed in order to obtain a suitable grade for the course.

Basic:
