**390216 - IAB1 - Food and Bioprocess Engineering: Background and Specificities**

**Coordinating unit:** 390 - ESAB - Barcelona School of Agricultural Engineering  
**Teaching unit:** 745 - EAB - Department of Agri-Food Engineering and Biotechnology  
**Academic year:** 2018  
**Degree:** MASTER’S DEGREE IN ENABLING TECHNOLOGIES FOR THE FOOD AND BIOPROCESSING INDUSTRY (Syllabus 2014). (Teaching unit Compulsory)  
**ECTS credits:** 5  
**Teaching languages:** Spanish, English

**Teaching staff**

**Coordinator:** MERCÈ RAVENTOS SANTAMARIA  
**Others:** GIL GORCHS ALTARRIBA - XAVIER FLOTATS RIPOLL

**Opening hours**

**Timetable:** Tuesday 16h-19h

**Prior skills**

Graduate students in science, engineering or technology disciplines with a diploma in areas close to agricultural engineering, food engineering, chemical or biosystems engineering, equivalent to 240 ETCS.

**Requirements**

Presentiality. Participation in solving problem exercises throughout the sessions.

**Degree competences to which the subject contributes**

**Specific:**

10. Identification of the materials, processes and equipments required for the treatment of food, bioproducts and packaging.  
11. Identification of the opportunities and knowledge of the scientific basis of nanotechnology application in the treatment of bioproducts. Identification of the benefits and risks of nanotechnology applied to food packaging and conservation.  
12. Identification of the production systems of raw materials. Identification of the effects caused by the production processes in the composition and properties of the raw materials and their appropriateness for a given transformation process.

**General:**

1. Ability to apply the language and techniques of industrial management in the agrifood and biotechnological sector  
2. Conceptualization of engineering in the agri-food and biotechnological industries.  
3. Ability to define, coordinate and implant new productive processes in the agri-food and biotechnological industries.  
4. Coordination and direction of complete engineering projects in the field of agri-food and bioprocesses.  
5. Identification of the technological, health and environmental requirements in food and bioproducts production.  
6. Identification of the industrial technologies with larger future impact and develop new applications of such
This subject aims at focusing the student on the thematic working areas while homogenizing the group and acquiring a common working language. It also provides the student with a clear panoramic view of the sector.

The content of this first subject is designed to establish a solid knowledge, partially learnt in previous university degrees in some cases, on which the food industry and biotechnology are based. In parallel, the subject seeks to provide self-assurance in the use of appropriate terminology. Thus, the fundamental concepts and the specificity of the sector will be reinforced. The new processes and products will be justified, stressing the quality management, food safety and environmental impact.

Transversal:

8. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

Teaching methodology

We indicate here the repertoire of teaching methods to be applied in the different training activities according to the teaching plans of the subject.

Lecture or conference: presentation of knowledge by university professors or by external specialists.

Participative classes: collective solving of exercises, conducted group discussions with the lecturer and other students in the classroom; classroom presentation of an activity individually or in small groups.

Project or short works: based on the realization, individually or in groups, of a work of reduced complexity or scope.

Information search: Information search by students, it allows the acquisition of knowledge, skills and attitudes related to obtaining information.

Visit: Visit of a group of students, conducted by professors, to an external facility, company or laboratory.

Evaluation activities.

Learning objectives of the subject

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Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 40h</th>
<th>32.00%</th>
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<tbody>
<tr>
<td></td>
<td>Guided activities: 5h</td>
<td>4.00%</td>
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<tr>
<td></td>
<td>Self study: 80h</td>
<td>64.00%</td>
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## Content

| Chapter 1 | Learning time: 13h 20m  
Theory classes: 13h 20m |
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>The raw materials of food processing industry and biotechnology. Crops and vegetable productions. Technology, recollection and transformation. Non destructive measurements of yield and maturity and quality parameters.</td>
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| Chapter 2 | Learning time: 13h 20m  
Theory classes: 13h 20m |
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| Chapter 3 | Learning time: 13h 20m  
Theory classes: 13h 20m |
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<tr>
<td><strong>Description:</strong></td>
<td>Basic principles of food and bioproducts process technology. Thermal processing, processing by removal of heat and processing by removal of water. Techniques for separation and concentration of food components. Specificities of food industries and biotechnology. Justification of new processes and products.</td>
</tr>
</tbody>
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## Qualification system

Continuous assessment, short tests, presentation and discussion of exercises in class.

## Regulations for carrying out activities

Presentiality. Continuous monitoring. Three deliveries.

## Bibliography