

## 390323 - IEF - Extraction and Fermentation Industries

Coordinating unit:	390 - ESAB - Barcelona School of Agricultural Engineering		
Teaching unit:	745 - EAB - Department of Agri-Food Engineering and Biotechnology		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)		
ECTS credits:	6	Teaching languages:	Catalan, Spanish

### Teaching staff

Coordinator: ELENA GORDUN QUILES

### Degree competences to which the subject contributes

Specific:

1. Food engineering and technology: Food technology.
2. Food engineering and technology: Processes in food industry.
3. Food engineering and technology: Modeling and optimization.

### Teaching methodology

Autonomous learning, students work outside the classroom part of the contents of the course with material for self-learning.

Directed learning, combine participatory lectures with lab-pilot plant sessions, visits to food industries and group work of a practical case study. Some learning activities are carried out cooperative work in small groups of students. Different activities will be evaluated on an ongoing basis; the use of the ATENEA virtual forum will be encouraged.

### Learning objectives of the subject

At the end of the course, the student should be able to:

- Describe the stages of the productive process of extraction and processed of raw materials (musts, flour, oil and fat).
- Describe the production of food products from the extractive and fermentation industries: ingredients, formulation, product development and technological processes from the raw material to the final product.
- Propose control parameters to minimize production losses and obtain a quality product that complies with current legislation and respects environmental and social aspects.

### Study load

Total learning time: 150h	Hours large group:	40h	26.67%
	Hours medium group:	0h	0.00%
	Hours small group:	20h	13.33%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

## 390323 - IEF - Extraction and Fermentation Industries

### Content

#### FERMENTED BEVERAGES. WINE AND BEER

Learning time: 75h 25m

Theory classes: 20h 25m

Laboratory classes: 10h

Self study : 45h

##### Description:

Major industries of fermented beverages. Brewing industry. Types of beer. Obtaining malt beer and brewing. Wine industry. Operations common to different types of winemaking. Production of white, rosé and red wines. Production of sparkling wine.

##### Related activities:

- Activity 1. Classroom activities
- Activity 2. Individual exam
- Activity 3. Laboratory work and pilot plant
- Activity 4. Visits to Food industries

#### FOOD OILS AND FATS

Learning time: 37h 42m

Theory classes: 10h 12m

Laboratory classes: 5h

Self study : 22h 30m

##### Description:

Sort of oils and fats for food use. Olive oil. Other vegetable oils and animal. Extraction of crude oils and fats. Refining and processing (fractionation, hydrogenation and interesterification). Applications of oils in the food industry. Selection criteria of an oil or fat.

##### Related activities:

- Activity 1. Classroom activities
- Activity 2. Individual exam
- Activity 3. Laboratory work and pilot plant
- Activity 4. Visit a Food industry

## 390323 - IEF - Extraction and Fermentation Industries

<p><b>CEREALS PRODUCTS</b></p>	<p>Learning time: 37h 43m</p> <p>Theory classes: 10h 13m Laboratory classes: 5h Self study : 22h 30m</p>
<p>Description: Wheat flour production process. Flour components and functionality in bread. Quality control and classification of flour.</p> <p>Related activities: Activity 1. Classroom activities Activity 2. Individual exam Activity 3. Laboratory work and pilot plant Activity 4. Visit a Food industry</p>	

### Planning of activities

<p><b>ACTIVITY 1: CLASSROOM ACTIVITIES</b></p>	<p>Hours: 98h Theory classes: 38h Self study: 60h</p>
<p><b>ACTIVITY 2: INDIVIDUAL EXAM</b></p>	<p>Hours: 2h Theory classes: 2h</p>
<p><b>ACTIVITY 3: LABORATORY WORK AND PILOT PLANT</b></p>	<p>Hours: 42h Laboratory classes: 14h Self study: 28h</p>
<p><b>ACTIVITY 4: VISIT A FOOD INDUSTRY</b></p>	<p>Hours: 8h Laboratory classes: 6h Self study: 2h</p>

## 390323 - IEF - Extraction and Fermentation Industries

### Qualification system

The final grade of the course,  $N_{final}$  is the sum of the following partial qualifications:

$$N_{final} = 0,45 N_1 + 0,45 N_2 + 0,1 \text{ (participation)}$$

$N_1$  (1 content) = 100% individual exam

$N_2$  (contents 2 and 3) = 70% individual exam + 30% tasks

### Bibliography

Basic:

Hidalgo, J. Tratado de enología. Madrid: Mundi-Prensa, 2003. ISBN 8484761355.

Hornsey, I. Elaboración de cerveza: microbiología, bioquímica y tecnología. Zaragoza: Acribia, 2002. ISBN 8420009679.

Adrian, A. La panificación: aspectos socioeconómicos, materias primas, agentes de fermentación, tecnología y calidad. Barcelona: Montagud, 1996. ISBN 8472120635.

Callejo, M.J. Industrias de cereales y derivados. Madrid: Mundi-Prensa, 2002. ISBN 8484760243.

Shahidi, F. Bailey's industrial oil and fat products. New York: John Wiley & Sons, 2005. ISBN 0471384607.

Bernardini, E. Tecnología de aceites y grasas. Madrid: Alhambra, 1981. ISBN 8420508187.