

Course guide

390323 - IEF - Extraction and Fermentation Industries

Last modified: 06/06/2023

Unit in charge: Barcelona School of Agri-Food and Biosystems Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Isabel Achaerandio

Others: Elena Sanchez
Amèlia Sarroca

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

| Type | Hours | Percentage |
|-------------------|-------|------------|
| Hours small group | 20,0 | 13.33 |
| Hours large group | 40,0 | 26.67 |
| Self study | 90,0 | 60.00 |

Total learning time: 150 h



CONTENTS

FERMENTED BEVERAGES. WINE AND BEER

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

Full-or-part-time: 75h 25m

Theory classes: 20h 25m

Laboratory classes: 10h

Self study : 45h

FOOD OILS AND FATS

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

Full-or-part-time: 37h 42m

Theory classes: 10h 12m

Laboratory classes: 5h

Self study : 22h 30m

CEREALS PRODUCTS

Description:

Wheat flour production process. Flour components and functionality in bread. Quality control and classification of flour.

Related activities:

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

Full-or-part-time: 37h 43m

Theory classes: 10h 13m

Laboratory classes: 5h

Self study : 22h 30m



ACTIVITIES

ACTIVITY 1: CLASSROOM ACTIVITIES

Full-or-part-time: 98h

Theory classes: 38h

Self study: 60h

ACTIVITY 2: INDIVIDUAL EXAM

Full-or-part-time: 2h

Theory classes: 2h

ACTIVITY 3: LABORATORY WORK AND PILOT PLANT

Full-or-part-time: 42h

Laboratory classes: 14h

Self study: 28h

ACTIVITY 4: VISIT A FOOD INDUSTRY

Full-or-part-time: 8h

Laboratory classes: 6h

Self study: 2h

GRADING SYSTEM

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

$N_{final} = 0,45 N1 + 0,45 N2 + 0,1$ (participation)

$N1$ (1 content) = 100% individual exam

$N2$ (contents 2 and 3) = 70% individual exam + 30% tasks



BIBLIOGRAPHY

Basic:

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- Hidalgo, J. Tratado de enología (volum 1) [on line]. Madrid: Mundi-Prensa, 2003 [Consultation: 22/12/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=3207253>. ISBN 8484761355.
- Hornsey, I. Elaboración de cerveza: microbiología, bioquímica y tecnología. Zaragoza: Acribia, 2002. ISBN 8420009679.
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- Ganjyal, Girish M. Extrusion cooking: cereal grains processing [on line]. 2nd edition. Duxford, England: Woodhead Publishing, 2020 [Consultation: 11/04/2023]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9780128153604/extrusion-cooking>. ISBN 9780128153604.
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