



Course guide

240641 - 240641 - Food Bioengineering

Last modified: 08/06/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023 **ECTS Credits:** 3.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: María Pilar Almajano

Others:

PRIOR SKILLS

Have passed the chemistry classes of the previous semesters.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:

06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

TEACHING METHODOLOGY

There will be 18 hours synchronous classes with active methodologies 8 hours dedicated to practices and are allocated 4 hour to visits. In non-contact hours delivered documents will be scheduled through Athena

LEARNING OBJECTIVES OF THE SUBJECT

1. Differentiate the fundamental components of food, their basic characteristics and the contribution of each component to the nutritional properties of the food.
2. Explain the most important spoilage reactions that can occur in food and design processing machines to minimise these reactions.
3. Determine the parameters that influence good control of the specific characteristics of foods that condition their processing, distribution and industrial preparation.
4. Apply food handling regulations
5. Apply, within the theoretical framework, the new food irradiation technologies.
6. Make decisions on the application of quality criteria to the food industry.
7. Prepare food samples to determine microbial contamination.
8. Theoretically calculate times and temperatures to reduce microbial contamination.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	30,0	40.00
Self study	45,0	60.00

Total learning time: 75 h

CONTENTS

Biomolecules

Description:

Proteins. Lipids. Carbohydrates. Exercises. Basic Food Chemistry. Components of food. Component contribution to the properties of food.

Related activities:

Lab practice

Full-or-part-time: 9h

Theory classes: 2h

Laboratory classes: 2h

Guided activities: 1h

Self study : 4h

Reactions in food

Description:

Main reactions occurring in food processing. Importance in its development

Related activities:

Laboratory practices

Full-or-part-time: 12h

Theory classes: 4h

Laboratory classes: 1h

Guided activities: 3h

Self study : 4h

Microbial contamination

Description:

Analysis of microbial contamination and determination of the main parameters as a function of temperature and treatment time.

Related activities:

Flipped classroom, lectures and laboratory practicals

Full-or-part-time: 9h

Theory classes: 1h

Practical classes: 1h

Guided activities: 3h

Self study : 4h

Quality and hygiene

Description:

Quality and hygiene in the food industry. HACCP system. Product testing and installations

Full-or-part-time: 8h

Theory classes: 3h

Guided activities: 1h

Self study : 4h



Biotechnology. GM food

Description:

Biotechnology. GM food

Related activities:

Work with scientific articles

Full-or-part-time: 7h

Theory classes: 2h

Guided activities: 2h

Self study : 3h

Food treatments

Description:

Treatments for energy supply

Thermal pasteurization and sterilization

Irradiation

Emerging Technologies

Related activities:

Team work. Exhibition in the classroom

Full-or-part-time: 15h

Theory classes: 2h

Practical classes: 1h

Guided activities: 6h

Self study : 6h

ACTIVITIES

Visit a food factories

Full-or-part-time: 4h

Theory classes: 4h

Laboratory practices

Full-or-part-time: 8h

Practical classes: 8h

Group work

Description:

Students will form groups of 3 to 5 students and on the first day of class they will decide on the theme of their team work, related to one of the topics of the course.

Full-or-part-time: 4h

Practical classes: 4h



GRADING SYSTEM

Classroom Activities 25%
Teamwork and lab work 25%
Theory test 35%
Practices 15%

BIBLIOGRAPHY

Basic:

- Alimentaria. Madrid: Ediciones y Publicaciones Alimentarias. S.A., 1964.
- Gustavo V. Barbosa-Canovas (ed). Novel food processing technologies. Boca Raton, FL: CRC Press, 2005. ISBN 082475333X.
- Juan A. Ordoñez (editor). Tecnología de los Alimentos. Madrid: Síntesis S.A., 1998. ISBN 84-7738-577-7.

RESOURCES

Audiovisual material:

- Nom recurs. Resource