Course guide
390222 - EC - Case Studies

Last modified: 22/05/2025

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

Degree: MASTER'S DEGREE IN ENABLING TECHNOLOGIES FOR THE FOOD AND BIOPROCESSING INDUSTRY (Syllabus 2014). (Compulsory subject).
MASTER'S DEGREE IN ENABLING TECHNOLOGIES FOR THE FOOD AND BIOPROCESSING INDUSTRY (Syllabus 2020). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Spanish, English

LECTURER

Coordinating lecturer: Hernandez Yañez, Eduard

Others: Lourdes Rodero
Fran García
Toni Oller
Marga López
Djamel Rahmani

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 the discussion of the problems posed during the course sessions.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
10. Innovation of new materials and processes for food and bioproducts. Designing of processes improving health, efficiency and environmental impact requirements.
11. Identification of the materials, processes and equipments required for the treatment of food, bioproducts and packaging.
12. Identification of the opportunities and knowledge of the scientific basis of photonics in measurement techniques, treatments and communication. Selection of new technologies for the food industry.
13. 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.

Generical:
1. Ability to apply the language and techniques of industrial management in the agrifood and biotechnological sector
2. Ability to define, coordinate and implant new productive processes in the agri-food and biotechnoloigcal industries.
3. Coordination and direction of complete engineering projects in the field of agri-food and bioprocesses.
4. Applying of comercialization systems and logistics to the agri-food and bioprocesses sector.
5. Identification of the industrial techonologies with larger future impact and develop new applications of such technologies in the food and biotechnological industry.
6. Ability to assess and improve the design of processes and products considering social and environmental impacts.

Transversal:
7. ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
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.

9. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

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.
Theoretical and practical works: conducted classroom activity or exercise, individually or in small groups, with the advice of the lecturer.
Wide-scope project: learning based on the design, planning and implementation of a project of wide complexity or length, applying and expanding previous knowledge and writing a complete project memory.
Information search: Information search by students, it allows the acquisition of knowledge, skills and attitudes related to obtaining information.
Case Study: A method used to study an individual, an institution, a problem, etc. in a detailed or contextual way. It is also a simulation technique where the students must make a decision about a particular problem (one case of a conflict is presented and the students must develop strategies for conflict resolution).
Evaluation activities.

LEARNING OBJECTIVES OF THE SUBJECT

After accomplishing the objectives of this subject, the student:
- Knows the tools to search for appropriate information for decision-making.
- Is familiar with the design, presentation and management of projects for the implementation of energy efficiency technologies in the agri-food and biotechnology sector
- Learn about the tools for integrating data from different sources to resolve real cases within the agri-food sector.

STUDY LOAD

Type	Hours	Percentage
Hours large group	35,0	28.00
Self study	90,0	72.00

Total learning time: 125 h

CONTENTS

Chapter 1

Description:
Study of examples of improvement in the agri-food and biotechnology sector that includes the following aspects:
- Work and present the proposed resolution of cases in a food or biotechnological industry, giving arguments to the decisions that are being made.
- Analyze the design of experiments.
- Analyze the aspects of innovation, entrepreneurship an sostenibility.
- Solve real cases of the agri-food sector integrating data from different sources (SIGPAC, Sentinel, Meteocat, etc...)
- Study and assess the energy efficiency of processes

Full-or-part-time: 125h
Theory classes: 35h
Self study : 90h

GRADING SYSTEM

Continuous evalutaion, participation in classes, oral presentation of the studied cases individually or in teams and the proposed solutions.
N1: energy efficiency
N2: design of experiments
N3: agricultural use case
N4: other activities and participation in conferences
Final note = 0,20 N1 + 0,20 N2 + 0,40 N3 + 0,20 N4

EXAMINATION RULES.

Presentiality. Continuous monitoring. Delivery and defense of works of each party.

BIBLIOGRAPHY

Basic:
- Clark, J. Peter. Case studies in food engineering : learning from experience. Dordrecht: Springer, 2009. ISBN 9781441904195.
- José L. García, Alicia Perdigones, Rosa M. Benavente and Fernando R. Mazarrón. "Influence of the New Energy Context on the Spanish Agri-Food Industry". Influence of the New Energy Context on the Spanish Agri-Food Industry [on line]. [Consultation: 02/01/2024]. Available on: https://www.mdpi.com/2073-4395/12/4/977.- Oscar Rodriguez-Gonzalez, Roman Buckow, Tatiana Koutchma, and V. M. Balasubramaniam. "Energy Requirements for Alternative Food Processing Technologies—Principles, Assumptions, and Evaluation of Efficiency". Comprehensive Review in Food Science and Food Safety.

RESOURCES

Other resources:
Use of software available in classrooms at the center: Python, Minitab, Matlab
Satellite databases (Copernicus, Sentinel), climatic (Meteocat), geographic information systems (SIGPAC), etc...