DEGREE CURRICULUM

PROCESSES IN THE FOOD INDUSTRY

Coordination: ARANTEGUI JIMENEZ, JAVIER

Academic year 2022-23

PROCESSES IN THE FOOD INDUSTRY 2022-23

Subject's general information

<table>
<tr><td>Subject name</td><td>PROCESSES IN THE FOOD INDUSTRY</td></tr>
<tr><td>Code</td><td>102231</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Food Science and Technology</td><td>3</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
<tr><td>Master's Degree in Management and Innovation in the Food Industry</td><td></td><td>COMPLEMENTARY TRAINING</td><td>Attendance-based</td></tr>
<tr><td>Master's Degree in Management and Innovation in the Food Insdustry</td><td></td><td>COMPLEMENTARY TRAINING</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>3</td><td>3</td></tr>
<tr><td>Number of groups</td><td>3</td><td>2</td></tr>
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<tr><td>Coordination</td><td>ARANTEGUI JIMENEZ, JAVIER</td></tr>
<tr><td>Department</td><td>FOOD TECHNOLOGY, ENGINEERING AND SCIENCE</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>Lectures: 52 h
Seminars: 8 h
Independent work: 84 h</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan / Spanish</td></tr>
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PROCESSES IN THE FOOD INDUSTRY 2022-23

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ARANTEGUI JIMENEZ, JAVIER	javier.arantegui@udl.cat	13,5	
LOPEZ FRUCTUOSO, MARIA LUISA	marialuisa.lopez@udl.cat	1,5	
MARIN SILLUE, SONIA	sonia.marin@udl.cat	0	

Subject's extra information

The main objective.of this course is introducing food processing technologies. They are described from the technological point of view and the main areas are preparation of raw materials, preservation processes, transformation, and packaging

Learning objectives

The student who passes this course should:

1. Know the different food processing operations
2. Being able to select the most appropriate technology for:
    a) Pre-processe raw materials
    b) Separate and concentrate food
    c) Preserve a food through the use of heat or cold
    d) Cause chemical and sensory changes
3. Being able to do calculations related to the operation and selection of various food processing equipment.

Competences

General skills

The following core competencies will be guaranteed at least:
CG2: Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study

CG4: That students can communicate information, ideas, problems and solutions to an audience both skilled and unskilled

CG5: That students have developed those skills needed to undertake further studies with a high degree of autonomy.

Furthermore, the graduate must be able to:

CG6: Analyze specific situations, identify problems, make decisions and implement plans of action in finding solutions.

CG8: Select and manage sources of written and computerized information available related to professional activity.

CG9: Use existing computing and communication tools such as support for the development of his business (strategic competition UdL)

CG10: Working alone and in multidisciplinary team.

CG11: Understand and express the proper terminology.

CG12: properly present information orally and in written form (strategic competition UdL)

CG13: To discuss and argue in various forums.

CG18: Having a critical and innovative spirit.

Specific skills

Graduates in Food Science and Technology after completing their studies will have acquired the following knowledge and skills:

Food Technology

CE21. Knowing the foundation and know how to apply the basic processes of food manufacturing operations.

CE22. Knowing the food processing equipment and know how to use

CE23. Outline, based on flowcharts, manufacturing processes and food preservation.

CE29. Select equipment and organize the lines of food processing and packaging.

Subject contents

1. Basic Principles. Food processing operations. Continuous and batch processing.

Physical changes

2. Preparation of raw material: Cleaning. Classification. Peeling.

3. Size reduction: solid food, liquid food.

4. Mixing. Molding.

Separation and concentration of food

5. Separation mechanical. Centrifugation. Filtration. Expression. Membrane concentration.

Sensory changes / chemical

6. Fermented food. Enzyme technology.

7. Processing by application of heat. Extrusion. Roasting and baking. Frying. Microwave and infrared radiation.

Food preservation

8. Condition for application of heat: scalding. Pasteurization. Sterilization.

9. Applications of low temperatures cold: Refrigeration. Freeze. Freeze drying. Concentration by freezing.

10. Modified atmosphere storage (MAS, CAS, MAP)

Methodology

Activity	Description	Activitat presencial alumne		Activitat no presencial alumne		Assessment	Time total/ECTS
		Objectives	Hours	Independent work	Hours	Hours	Hores
Lectures	Lecture	Explanation of the main concepts	**47**	Learn, understand and syntetize knowledge	**70**	4	**121/4.84**
Problems	Classe participativa (Aula. Grup gran)	Solution of problems	**5**	Learn to solve problems	**10**	**1**	**16/0.64**
Seminars	Classe participativa (Grup mitjà)	Activities of discussion or application of knowledge	**8**	Discussion of the topics of the seminars	**4**	1	**13/0.52**
Totals			**60**		**84**	6	**150/6**

Development plan

Grup: Grau en Ciència i Tecnologia d'Aliments

Temes 1 a 5: M.L. López

Temes 6 a 10: J. Arántegui

Grup: Complement Màster GIIA

Classes impartides per J. Arántegui

Evaluation

Assessment criteria for the course

1. Written assignments : 20%
2. Exams: 80%

To pass first opportunity evaluation you must get a minimum 4/10 points in each written exam.

Bibliography

Basic bibliography

- P. Fellows. “Food Processing Technology. Principles and Practice. Second Edition”. Woodhead Publishing Limited, 2000, Cambridge, England.
- R.L. Earle and M.D. Earle. “Unit Operations in Food Industry – the Web Edition” http://www.nzifst.org.nz/unitoperations

Complementary bibliography

- Juan A. Ordoñez (editor). “Tecnología de los Alimentos. Volumen I. Componentes de los alimentos y procesos” Ed. Síntesis, 1997, Madrid, España.
- J.G. Brennan, J.R. Butters, N.D. Cowell y A.E.V. Lilly “Las operaciones de la ingeniería de los alimentos.” Ed. Acribia, 1980, Zaragoza, España.
- Alfred Bartholomai “Fábricas de Alimentos” Ed. Acribia, 1991, Zaragoza, España.
- Robert H. Perry et al. (Eds.). “Manual del ingeniero químico.” Ed. McGraw-Hill, 1992, México.
- Juan A. Ordoñez (editor). “Tecnología de los Alimentos. Volumen II. Alimentos de origen animal.” Ed. Síntesis, 1997, Madrid, España.
- Cenzano et al. “Nuevo manual de industrias alimentarias” Ed. Mundi-Prensa, 1993, Madrid, España.