

390330 - OPA - Food Processing Operations

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, English

Teaching staff

Coordinator: MERCÈ RAVENTOS SANTAMARIA

Degree competences to which the subject contributes

Specific:

1. Food engineering and technology: Engineering and basic operations in food industry.
2. Food engineering and technology: Food technology.
3. Food engineering and technology: Processes in food industry.
4. Engineering of agri-food industry: Auxiliary equipments and machinery in agri-food industry.
5. Engineering of agri-food industry: Automation and process control.
6. Engineering of agri-food industry: Waste management and uses of wastes.

Transversal:

7. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

Teaching methodology

Learning objectives of the subject

With the follow-up of this subject there is claimed that the student achieves a basic vocabulary and a clear overall view of the stages of the processes of the food processing industry. One tries to introduce the student in the basic concepts of the unitary operations applied to the food production, bearing in mind technologies that allow saving and efficiency of water and of energy between(among) other environmental aspects.

General aims(lenses):

On having finished the subject of basic operations the pupil will be capable of:

- To identify the unitary existing processes in the industry would feed the basic beginning(principles) that govern them.
- To define, to explain and to quantify the most important unitary processes doing special emphasis to the qualit aspects, safety(security) and environment.
- To consider and to solve applied(hardworking) balance sheets(assessments) of matter and energy to evaporating and dryers
- To identify and to indicate the functioning of the principal equipments(teams) of the food processing industry nowadays used.

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- To define and to explain the productive process most adapted to obtain a certain food as well as the most viable and suitable alternatives of a technological and environmental point of view.
- To use books, magazines, catalogues specialized in processes to the industry it(he,she) would feed
- To select instruments of measure and control to obtain a major efficiency, a good follow-up and saving of energy in the processes of the food processing industry.

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%

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Content

Trabajo de un procesado específico de un alimento

Learning time: 60h

Theory classes: 14h

Laboratory classes: 10h

Self study : 36h

Description:

.From the process of production of a food known product to realize the flow chart. To determine the equipments(teams), facilities and necessary controls to carry out the process. To determine the most important variables that intervene as well as the systems of measure and control that can be applied. To propose a balance sheet(assessment) of matter and to estimate the energetic corresponding consumptions. To propose improvements with regard to the traditional system of functioning. Systems of saving water and of energy. They can propose equipments(teams) of own(proper) design, to include programs of simulation... Oral Defense, debate, critique and conclusions to the developed work.

Fundamental concepts. Steam tables. The evaporating one: description and types. Problems of functioning. Accessories. Balance sheets(assessments) of matter and energy. Evaporation with multiple effect. Thermal recompression of the steam. Mechanical recompression of steam. Psicrometría. Isotherms of sorción. Stages of the dehydration to the air. Facilities and equipments(teams) used in the industry (direct, indirect, for radiation). Criteria of selection. Balance sheet(assessment) of matter and energy of a dryer in I continue. Recirculation of the air. Reheating of the air of dried.

The cold in the conservation of the food. Weather forecast of refrigeration and of the time of freezing. Effects of the process on the food. The release. Industrial equipments(teams). Concentration for freezing. Freezing-point and viscosity of the fluid to treating. Equipments(teams) and applications of the crioconcentración. Foundations of the liofilización. The cycle of liofilización. Industrially used equipments(teams). Necessary controls.

Related activities:

(ENG) Activitat 1: Classe d'explicació teòrica

Activitat 2: Prova individual d'avaluació final

Activitat 4: Treball específic

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<p>(ENG) EVAPORACIÓ D'ALIMENTS</p>	<p>Learning time: 50h Theory classes: 14h Laboratory classes: 6h Self study : 30h</p>
<p>Description: (ENG)Conceptos fundamentales. Tablas de vapor. El evaporador: descripción y tipos. Problemas de funcionamiento. Accesorios. Balances de materia y energía. Evaporación con múltiple efecto. Recompresión térmica del vapor. Recompresión mecánica de vapor.Psicrometría. Isotermas de sorción. Etapas de la deshidratación al aire. Instalaciones y equipos utilizados en la industria (directos, indirectos, por radiación). Criterios de selección. Balance de materia y energía de un secador en continuo. Recirculación del aire. Recalefacción del aire de secado.</p> <p>Related activities: (ENG) Activitat 1: Classe d'explicació teòrica Activitat 2: Prova individual d'avaluació final Activitat 3: Resolució d'exercicis</p>	
<p>(ENG) OPERACIONS BÀSIQUES PRELIMINARS I DE PROSTPROCESSAT</p>	<p>Learning time: 40h Theory classes: 12h Laboratory classes: 4h Self study : 24h</p>
<p>Description: (ENG) El frío en la conservación de los alimentos. Predicción del tiempo de refrigeración y del tiempo de congelación. Efectos del proceso sobre el alimento. La descongelación. Equipos industriales. Concentración por congelación. Punto de congelación y viscosidad del fluido a tratar. Equipos y aplicaciones de la crioconcentración. Fundamentos de la liofilización. El ciclo de liofilización. Equipos industrialmente utilizados. Controles necesarios.</p> <p>Related activities: (ENG) Activitat 1: Classe d'explicació teòrica Activitat 2: Prova individual d'avaluació final Activitat 3: Resolució d'exercicis Activitat 4: Treball específic</p>	

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Planning of activities

(ENG) ACTIVITAT 1: CLASSES D'EXPLICACIÓ TEÒRICA	Hours: 38h Theory classes: 38h
(ENG) ACTIVITAT 2: PROVES INDIVIDUALS D'AVALUACIÓ	Hours: 2h Theory classes: 2h
(ENG) ACTIVITAT 3: RESOLUCIÓ D'EXERCICIS I PROBLEMES	Hours: 54h Laboratory classes: 8h Self study: 46h
(ENG) ACTIVITAT 4: TREBALL ESPECÍFIC	Hours: 52h Laboratory classes: 10h Self study: 42h
(ENG) ACTIVITAT 5: PRÀCTIQUES DE LABORATORI	Hours: 4h Laboratory classes: 2h Self study: 2h

Qualification system

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Bibliography

Basic:

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Brennan, J.G. Manual del procesado de los alimentos. Zaragoza: Acribia, 2007. ISBN 9788420010991.

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Casp Vanaclocha, Ana; Abril Requena, José. Procesos de conservación de alimentos. 2a ed. Madrid: Madrid Vicente: Mundi-Prensa, 2003. ISBN 848476169X.

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Complementary:

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