

Beverages and Foods of Plant Origin

Code: 103978
ECTS Credits: 6

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Degree	Type	Year
Food Science and Technology	OT	4

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Teachers

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Teaching groups languages

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Prerequisites

The student should have done the courses *Mètodes de processament d'aliments I* and *II* of third year.

Objectives and Contextualisation

Begudes i aliments d'origen vegetal is the application of knowledges achieved mainly in *Mètodes de processament d'aliments I* and *II*.

It integrates and gives you knowledge about working of industries of beverages and foods of plant origin, from raw material receipt to final product storage.

Competences

- Analyse, summarise, resolve problems and make professional decisions.
- Apply the principles of processing techniques and evaluate their effects on the quality and safety of the product.
- Develop individual learning strategies and planning and organisation skills.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Search for, manage and interpret information from different sources.
- Show understanding of the mechanisms by which raw materials deteriorate and the reactions and changes that take place during storage and processing, and apply the methods for controlling this.

Learning Outcomes

1. Analyse, summarise, resolve problems and make professional decisions.
2. Apply the technological processes that are specific to milk and dairy products, meat and meat derivatives, fish products, egg products and vegetable products, and understand the modifications to the final product that these processes make.
3. Design complex processes in accordance with the established quality criteria.
4. Develop individual learning strategies and planning and organisation skills.
5. Foresee and solve problems that are specific to the food industries.
6. Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
7. Search for, manage and interpret information from different sources.
8. Select food conservation methods that slow down deterioration.
9. Select processes of conservation, transformation, transport and storage that are suited to foods of animal and plant origin.

Content

Theoretical classes

Lecture 1. Cocoa. Cocoa nibs. Cocoa powder and cocoa butter. Cocoa butter substitutes. Chocolate.

Lecture 2. Coffee. Green coffee. Roasting. Grinding. Decaffeination process. Instant coffee.

Lecture 3. Flours. Cereal grains: structure and composition. Milling. Flours: treatments and types.

Lecture 4. Baking. Bread and baking products. Formulation. Kneading. Proofing. Baking. Preservation.

Lecture 5. Other products derived from cereals. Biscuits. Pasta.

Lecture 6. Virgin olive oils. Description. Harvesting and transport to processing plant. Cleaning and washing. Milling. Beating. Centrifuging: two and three phases. Storage.

Lecture 7. Other oils and fats. Olive pomace oil. Oleaginous seed oils. Extraction: pressing and organic solvents. Vegetable fats: palm, palm kernel, coconut. Margarine. Transformations: interesterification, hydrogenation, fractionation.

Lecture 8. Refining. Chemical refining. Degumming. Neutralizing. Bleaching. Winterization. Deodorizing. Physical refining. Compound loss and formation.

Lecture 9. Fruit juices. Description. Citrus fruits (orange). Harvesting and pre-extraction processing. Extraction. Clarification. Manufacture of concentrated juice (vacuum thermoevaporation) and juice from concentrated juice (reconstitution). Apple. Peach. Pineapple. Grape.

Lecture 10. Bottled drinking waters and soft drinks. Description. Carbonated soft drinks. Ingredients and additives: water (pre-treatments and deaeration), compound syrup and CO₂ (carbonatation). Bottling. Non-carbonated soft drinks.

Practical classes

A) VISITS TO FOOD INDUSTRIES

B) LABORATORY: Gelatinisation and microscopy and sensory identification of starches

C) TALKS:

- "Fibres and stabilising systems"
- "Candy"
- "Snacks"
- "Alternative proteins"

D) FOOD MANUFACTURE IN PROCESSING PLANT:

- Bread
- Tiger nut milk

E) SEMINARS: exposition, discussion and evaluation of reports.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory	2	0.08	1, 2, 7, 4, 3, 5, 9, 8
Processing plant	4	0.16	1, 2, 7, 4, 3, 5, 9, 8
Seminars	4	0.16	1, 2, 7, 4, 3, 5, 9, 8
Talks	5	0.2	1, 2, 7, 4, 3, 5, 9, 8
Theoretical classes	29	1.16	2, 3, 5, 9, 8
Visits	9	0.36	1, 2, 3, 5, 9, 8
Type: Supervised			
Tutorials	2	0.08	
Type: Autonomous			
Self-learning brief exercises	2	0.08	1, 2, 4, 3, 5, 9
Study and bibliography search	61	2.44	2, 7, 4, 3, 5, 9, 8
Writing and exposition of a report	30	1.2	2, 7, 4, 3, 5, 9, 8

Methodology:

- Theoretical classes: the student will achieve the basic contents of the course; exercise resolution is included, and also the correction of three self-learning brief exercises which are previously and individually solved.
- Practical classes: they complete and reinforce knowledges achieved in theoretical classes.
 Visits (and talks) bring the student near to the professional sector, and thus allow him/her to know problems occurred in a food industry and tasks that he/she will do there in the future.
 Laboratory and processing plant activities allow the student to achieve skills and understand experimental concepts; the student will have guide notes containing aim, basis, methodology and results section.
 Seminars (talks, reports): to complete and go in depth in theoretical contents, by analysing information, solving questions, and discussing and exchanging ideas and knowledges.
- Tutorials: to inform about content and working of the course; to clarify concepts and solve doubts; to evaluate the students.

Materials used in the course are in Moodle platform: legislation, presentations showed in theoretical classes, guide notes and other documents used in practical classes, multimedia, supplementary information, photos, grades.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	35 % final grade	2	0.08	1, 2, 3, 6, 5, 9, 8
Report	17 % final grade	0	0	1, 2, 7, 4, 3, 5, 9, 8
Self-learning brief exercises	8 % final grade	0	0	1, 2, 7, 4, 3, 5, 9

The following will be evaluated:

- Attendance to theoretical classes: 10 %.
- Attendance to practical classes: 30 %.
- Report: 17 %. Students will write and present a report in groups.
- Self-learning brief exercises: 8 %. Students will solve individually three exercises, which will be corrected and discussed in the lecture room.
- Exam: 35 %. In the end of semester, the student will do, in writing, an exam (containing test and short questions).

This course does not contemplate the single assessment option.

Bibliography

Coffee and cocoa

- * Afoakwa, EO. 2016. Chocolate science and technology. Wiley-Blackwell, Oxford, United Kingdom
- * Beckett, ST. 2008. The science of chocolate. RSC Publishing, Cambridge, United Kingdom
- * Beckett, ST, MS Fowler, GR Ziegler. 2017. Industrial chocolate manufacture and use. Wiley-Blackwell, Oxford, United Kingdom
- * Clarke, RJ, OG Vitzthum. 2001. Coffee. Recent developments. Blackwell Publishing, Oxford, United Kingdom
- * Folmer, B. 2017. The craft and science of coffee. Academic Press, London, United Kingdom
- * Garti, N, NR Widlak. 2012. Cocoa butter and related compounds. AOCS Press, Urbana, Illinois, USA
- * Minifie, BW. 1999. Chocolate, cocoa, and confectionery. Science and technology. Aspen Publishers, Gaithersburg, Maryland, USA

- * Mohos, FA. 2010. Confectionery and chocolate engineering. Principles and applications. Wiley-Blackwell, Oxford, United Kingdom
- * Talbot, G. 2009. Science and technology of enrobed and filled chocolate, confectionery and bakery products. Woodhead Publishing, Cambridge, United Kingdom
- * Wintgens, JN. 2004. Coffee: growing, processing, sustainable production. A guidebook for growers, processors, traders, and researchers. Wiley-VCH, Weinheim, Germany

Cereals and their products

- * Arendt, EK, F Dal Bello. 2008. Gluten-free cereal products and beverages. Academic Press, London, United Kingdom
- * BeMiller, J, R Whistler. 2009. Starch. Chemistry and technology. Academic Press, London, United Kingdom
- * Cauvain, SP. 2003. Bread making: improving quality. CRC Press, Boca Raton, Florida, USA
- * Cauvain, SP. 2015. Technology of breadmaking. Springer International Publishing, Heidelberg, Germany
- * Cauvain, SP, LS Young. 2002. Fabricación de pan. Acribia, Zaragoza
- * Cauvain, SP, LS Young. 2008. Productos de panadería. Ciencia, tecnología y práctica. Acribia, Zaragoza
- * Cauvain, SP, LS Young. 2009. More baking problems solved. Woodhead Publishing, Cambridge, United Kingdom
- * Davidson, I. 2016. Biscuit baking technology. Processing and engineering manual. Academic Press, London, United Kingdom
- * Davidson, I. 2018. Biscuit, cookie and cracker production. Academic Press, London, United Kingdom
- * Dendy, DAV, BJ Dobraszczyk. 2004. Cereales y productos derivados. Química y tecnología. Acribia, Zaragoza
- * Edwards, WP. 2007. The science of bakery products. RSC Publishing, Cambridge, United Kingdom
- * Finnie, S, WA Atwell. 2016. Wheat flour. AACCC International, Saint Paul, Minnesota, USA
- * Hamaker, BR. 2007. Technology of functional cereal products. Woodhead Publishing, Cambridge, United Kingdom
- * Kill RC, K Turnbull. 2004. Tecnología de la elaboración de pasta y sémola. Acribia, Zaragoza
- * Manley, DJR. 2011. Technology of biscuits, crackers, and cookies. Woodhead Publishing, Cambridge, United Kingdom
- * Owens, G. 2001. Cereals processing technology. Woodhead Publishing, Cambridge, United Kingdom
- * Pérez, N, G Mayor, VJ Navarro. 2001. Procesos de pastelería y panadería. Paraninfo, Madrid
- * Preedy, VR, RR Watson, VB Patel. 2019. Flour and breads and their fortification in health and disease prevention. Academic Press, London, United Kingdom
- * Rosenttrater, KA, AD Evers. 2018. Kent's technology of cereals. An introduction for students of food science and agriculture. Woodhead Publishing, Cambridge, United Kingdom
- * Schell, V. 2020. El pan. Panadería artesanal. Acribia, Zaragoza
- * Sluimer, P. 2005. Principles of breadmaking. Functionality of raw materials and process steps. American Association of Cereal Chemists Press, Saint Paul, Minnesota, USA

* Wrigley, C, D Miskelly, I Batey. 2017. Cereal grains: assessing and managing quality. Woodhead Publishing, Cambridge, United Kingdom

* Zhou, W, YH Hui, I De Leyn, MA Pagani, CM Rosell, JD Selman, N Therdthai. 2014. Bakery products. Science and technology. Wiley-Blackwell, Oxford, United Kingdom

Fruits and vegetables, and fruit juices

* Ashurst, PR. 1999. Producción y envasado de zumos y bebidas de frutas sin gas. Acribia, Zaragoza

* Ashurst, PR. 2016. Chemistry and technology of soft drinks and fruit juices. Wiley-Blackwell, Oxford, United Kingdom

* Ashurst, PR, R Hargitt, F Palmer. 2017. Soft drink and fruit juice problems solved. Woodhead Publishing, Cambridge, United Kingdom

* Asociación Nacional de Fabricantes de Zumos y Gazpachos (Zumos y Gazpachos de España):
www.zumosygazpachos.com

* Barrett, DM, L Somogyi i H Ramaswamy. 2005. Processing fruits. Science and technology. CRC Press, Boca Raton, Florida, USA

* Florkowski, WJ, NH Banks, RL Shewfelt, SE Prussia. 2022. *Postharvest handling. A systems approach*. Academic Press, London, United Kingdom

* Hui, YH, S Ghalaza, DH Graham, KD Murrell, W-K Nip. 2004. Handbook of vegetable preservation and processing. Marcel Dekker, New York, New York, USA

* Kimball, DA. 2001. Procesado de cítricos. Acribia, Zaragoza

* Rao, ChG. 2015. Engineering for storage of fruits and vegetables. Cold storage, controlled atmosphere storage, modified atmosphere storage. Academic Press, London, United Kingdom

* Salunkhe, DK, SS Kadam. 2003. Tratado de ciencia y tecnología de las hortalizas. Acribia, Zaragoza

* Sánchez, MT. 2004. Procesos de conservación poscosecha de productos vegetales. Mundi-Prensa Libros, Madrid

* Siddiqui, MW. 2018. Postharvest disinfection of fruits and vegetables. Academic Press, London, United Kingdom

* Sinha, NK, YHHui, EÖEvranuz, M Siddiq, J Ahmed. 2011. Handbook of vegetables and vegetable processing. Wiley-Blackwell, Oxford, United Kingdom

* Sinha, NK, JS Sidhu, J Barta, JSB Wu, MP Cano. 2012. Handbook of fruits and fruit processing. Wiley-Blackwell, Oxford, United Kingdom

* Thompson, AK. 2016. Fruit and vegetable storage. Hypobaric, hyperbaric and controlled atmosphere. Springer International Publishing, Heidelberg, Germany

* Valero, D, M Serrano. 2010. Postharvest biology and technology for preserving fruit quality. CRC Press, Boca Raton, Florida, USA

* Yahia, EM. 2019. Postharvest physiology and biochemistry of fruits and vegetables. 2019. Woodhead Publishing, Cambridge, United Kingdom

Oils and fats

* Aparicio, R, J Harwood. 2003. Manual del aceite de oliva. Mundi-Prensa Libros, Madrid

* Boskou, D. 2006. Olive oil. Chemistry and technology. AOCS Press, Urbana, Illinois, USA

* Civantos, L. 2008. Obtención del aceite de oliva virgen. Agrícola Española, Madrid

- * Dijkstra, AJ. 2019. Edible oil processing. AOCS Lipid Library, Urbana, Illinois, USA (<https://lipidlibrary.aocs.org/edible-oil-processing>)
- * Farr, WE, A Proctor. 2012. Green vegetable oil processing. AOCS Press, Urbana, Illinois, USA
- * Fundación Española del Aceite de Palma Sostenible: www.aceitedepalmasostenible.es
- * Graciani, E, MP Pérez, MV Ruiz. 2012. Los aceites y grasas. Refinación y otros procesos de transformación industrial. AMV Ediciones, Madrid
- * Gunstone, FD. 2006. Modifying lipids for use in food. Woodhead Publishing, Cambridge, United Kingdom
- * Gunstone, FD. 2008. Oils and fats in the food industry. Wiley-Blackwell, Oxford, United Kingdom
- * Lawson, H. 1999. Aceites y grasas alimentarios. Tecnología, utilización y nutrición. Acribia, Zaragoza
- * Madrid, A. 2016. El aceite de oliva. Tecnología, análisis sensorial y denominaciones de origen. AMV Ediciones, Madrid
- * Madrid, A, I Cenzano, J Madrid. 1997. Manual de aceites y grasas comestibles. Mundi-Prensa Libros, Madrid
- * O'Brien, RD. 2009. Fats and oils. Formulating and processing for applications. CRC Press, Boca Raton, Florida, USA
- * O'Brien, RD, WE Farr, PJ Wan. 2000. Introduction to fats and oils technology. AOCS Press, Champaign, Illinois, USA
- * Rajah, KK. 2014. Fats in food technology. Wiley-Blackwell, Oxford, United Kingdom
- * Talbot, G. 2015. Specialty oils and fats in food and nutrition. Properties, processing and applications. Woodhead Publishing, Cambridge, United Kingdom
- * Vera, M. 2011. Aceite de oliva virgen extra. Su obtención y conservación. AMV Ediciones, Madrid

Waters and soft drinks (also see "Fruits and vegetables, and fruit juices")

- * Asociación de Bebidas Refrescantes (ANFABRA): www.refrescantes.es
- * Asociación de Aguas Minerales de España (ANEABE): www.aneabe.com
- * Dege, NJ. 2011. Technology of bottled water. Wiley-Blackwell, Oxford, United Kingdom
- * Mitchell, AJ. 1990. Formulation and production of carbonated soft drinks. Blackie and Son, Glasgow, United Kingdom
- * Paquin, P. 2009. Functional and speciality beverage technology. Woodhead Publishing, Cambridge, United Kingdom
- * Senior, DAG, PR Ashurst. 2001. Tecnología del agua embotellada. Acribia, Zaragoza
- * Steen, DP, PR Ashurst. 2006. Carbonated soft drinks. Formulation and manufacture. Blackwell Publishing, Oxford, United Kingdom
- * Tampo, D. 1999. Aguas envasadas. Limusa, Mexico, DF, Mexico
- * Varnam, AH, JP Sutherland. 1997. Bebidas. Tecnología, química y microbiología. Acribia, Zaragoza

Other impulse channel products

- * Asociación Española del Dulce (Produlce): www.produlce.com
- * Asociación de Snacks: www.asociacionsnacks.es

* Bouvier, J-M, OH Campanella. 2014. *Extrusion processing technology. Food and non-food biomaterials*. Wiley-Blackwell, Oxford, United Kingdom

* Corominas, A, A Hernández, A Marcos, F Rodríguez. 2007. El libro blanco de los productos de aperitivo. Semfyc Ediciones, Barcelona

* Rooney, LW, SO Serna-Saldivar. 2015. *Tortillas: wheat flour and corn products*. AACC International, Saint Paul, Minnesota, USA

Software

No special software is required.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan	second semester	morning-mixed
(TE) Theory	1	Catalan	second semester	morning-mixed