

Academic Year/course: 2021/22

28951 - Processing technologies in the food industries

Syllabus Information

Academic Year: 2021/22

Subject: 28951 - Tecnología de las industrias agroalimentarias

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process that is designed for this subject is based on the following:

- Lectures: participatory lectures which will deepen the quality assessment of raw of animal and vegetable origin and in the processes for the conservation of these raw materials and of the products derived therefrom.

- Practice sessions in the laboratory where students become familiar with the quality parameters of different foods and the factors influencing their elaboration process and its final quality.

- Visits to food industries: visits to food industries are crucial for practical training of students. They are an indispensable complement to theoretical explanations, especially those related to some technological processes that are difficult to understand for the student, even with flow charts, graphs or diagrams used in theoretical teaching. Before the visit, the processes and the salient features of the establishment will be explained. This will allow students to more easily follow the explanations of technicians and allow an exchange of views with students.

- Mentored or academically directed group work: the knowledge and skills acquired in the course will be integrated with the completion of a group work in which students have to elaborate on the Pilot Plant a food product that previously has been assigned by the teacher. To do this they must first identify the raw materials, ingredients and additives used, the necessary equipment and its operating parameters, the processes of maturation and/or storage after manufacture and then run it to present the product as appear on the market, including labelling, and taking into account legal requirements.

All materials and resources used in teaching will be available in the Digital Teaching Ring the University of Zaragoza offers students and teachers (<http://add.unizar.es>).

4.2. Learning tasks

The course includes the following learning tasks:

- 30 hours of lectures (participative master classes)
- 10 hours of laboratory practices organized in 5 sessions of 2 hours.
- 10 hours of visits to food industries organized in 3 visits of 3 - 4 hours
- 10 hours for preparation, implementation and presentation of a mentored work organized in 5 sessions of 1, 2 and 4 hours (for the session in the pilot plant).

- Academic tutorials: Students will have the support and advice of the teacher. The schedule will present well in advance.

4.3. Syllabus

The course will address the following topics:

Theory sessions

UNIT 1. INTRODUCTION

- Topic 1. Introduction to the subject Technology of Agro-Food Industries (0,5 ECTS)
 - Teaching/learning activities:
 - Participatory Master Class: 0,5 ECTS

UNIT 2. TECHNOLOGY OF MEAT AND MEAT PRODUCTS

- Topic 2. Introduction (0,05 ECTS)
- Topic 3. Transformation of muscle in meat (0,1 ECTS)
- Topic 4. Quality of meat (0,15 ECTS)
- Topic 5. Fresh meat technology (0.1 ECTS)
- Topic 6. Meat derivatives: classification and main technological processes (0,3 ECTS)
- Topic 7. The technology of meat preparations and raw meat products (0.1 ECTS)
- Topic 8. The technology of whole raw meat products (0.1 ECTS)
- Topic 9. Heat-treated meat products technology (0.1 ECTS)
 - Teaching/learning activities:
 - Participatory Master Class: 1 ECTS

UNIT 3. FISH AND FISH PRODUCTS TECHNOLOGY

- Topic 11. Fish Technology (0.1 ECTS)
- Topic 12. The technology of fish products (0.1 ECTS)
 - Teaching/learning activities:
 - Participatory Master Class: 0,2 ECTS

UNIT 4. TECHNOLOGY OF MILK AND DAIRY PRODUCTS

- Topic 13. Introduction to the dairy sector (0,05 ECTS)
- Topic 14. Composition and physical-chemical structure of milk (0,15 ECTS)
- Topic 15. Physical, physical-chemical and organoleptic properties of milk. Hygienic quality of milk (0,1 ECTS)
- Topic 16. Collection, refrigeration and previous operations to the thermal treatment of milk (0.1 ECTS)
- Topic 17. Pasteurized milk and sterilized milk (0,1 ECTS)
- Topic 18. Concentrated milk (0.1 ECTS)
- Topic 19. Fermented milk: yoghurt and other fermented milk (0,1 ECTS)

Unit 20. Cream and butter (0,1 ECTS)

- Topic 21. Cheese (0,2 ECTS)
 - Teaching/learning activities:
 - Participatory Master Class: 1 ECTS

UNIT 5. TECHNOLOGY OF EGG AND OVOPODULTS

- Topic 22. Egg and egg products (0 ECTS)
 - Teaching/learning activities:
 - Participatory Master Class: 0.1 ECTS

UNIT 6. TECHNOLOGY OF VEGETABLE PRODUCTS AND DERIVATIVES

- Topic 23. Introduction to the horticultural sector (0,5 ECTS)
- Topic 24. Characteristics and conservation of fresh fruits and vegetables (0.1 ECTS)
- Topic 25. Minimally processed products and products of the fifth range (0,05 ECTS)
- Topic 26. Canned, frozen and dehydrated fruit and vegetable products (0,15 ECTS)
- Topic 27. Juice and chromogen production (0.1 ECTS)
- Topic 28. Flour and bread (0.1 ECTS)
- Topic 29. Olive and olive oil production (0.1 ECTS)

- Teaching/learning activities:
- Participatory Master Class: 0,65 ECTS
- Practical sessions

UNIT 2. TECHNOLOGY OF MEAT AND MEAT PRODUCTS

- Practical 1. Meat quality parameters (0.2 ECTS)
- Practical 2. Determination of meat additives (0.2 ECTS)
 - Visit the meat processing industry (0,3 ECTS)
 - Teaching/learning activities:
 - Laboratory Practice: 0,4 ECTS
 - Visits to agro-food industries: 0,3 ECTS

UNIT 4. TECHNOLOGY OF MILK AND DAIRY PRODUCTS

- Practical 3. Milk Quality Parameters (0.2 ECTS)
- Practical 4. Parameters for the control of the thermal treatment of milk. Factors influencing milk coagulation (0,2 ECTS)
 - Visit the cheese and yoghurt processing industry (0,3 ECTS)
 - Teaching/learning activities:
 - Laboratory Practice: 0,4 ECTS
 - Visits to agro-food industries: 0,3 ECTS

UNIT 6. TECHNOLOGY OF HORTO-FRUIT PRODUCTS AND DERIVATIVES

- Practical 5. Influence of different parameters on the organoleptic and nutritional quality of foods of plant origin (0.2 ECTS)
 - Visit the juice processing industry (0,4 ECTS)
 - Teaching/learning activities:
 - Laboratory Practice: 0,2 ECTS
 - Visits to agro-food industries: 0,4 ECTS
 - For the whole subject and coinciding temporarily with units 3, 4 and 5: Tutores work: 1 ECTS

4.4. Course planning and calendar

Type of activity / Week	1	2	3 ⁽¹⁾	4	5	6 ⁽²⁾	7	8	9	10 ⁽³⁾	11	12	13	14	15	16	17
<i>In-class Activity</i>	[Greyed out]																
Theory	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
Problems																	
Laboratory			2	2			2		2					2			
Group work								2		2		2	2	2			
Fieldwork					3					3			4				
Tutorials ECTS																	
Assessment						1									1		
<i>No presential activity</i>	[Greyed out]																
Autonomous work	4	4	4	4	4	4	4	4	4	4,5	4	3	4	4	3	4	4
Group work					1,5		1,5	1,5				1,5	1,5		2		
TOTAL	6	6	8	8	10,5	7	9,5	8	9,5	11,5	6	8,5	13,5	10	6	4	4

4.5. Bibliography and recommended resources

- BB** Ciencia de los alimentos : bioquímica, microbiología, procesos, productos. Volumen 2, Tecnología de los productos alimentarios / coordinadores, Romain Jeantet... [et al.]. Zaragoza : Acribia, 2010
- BB** Madrid Vicente, Antonio. Nuevo manual de industrias alimentarias / autores, Antonio Madrid Vicente, Javier Madrid Cenzano. [3ª] ed. amp. y corr. Madrid : A. Madrid Vicente : Mundi-Prensa, 2001
- BB** Manual de industrias de los alimentos. [director y autor] M.D. Ranken. 2ª ed. Zaragoza : Acribia, D.L. 1993
- BB** Tecnología de los alimentos. Vol. II, Alimentos de origen animal / Juan A. Ordóñez Pereda (editor). Madrid : Síntesis, D.L. 1998
- BC** Bylund, Gösta. Manual de industrias lácteas / texto : Gösta Bylund ; traducción de la versión inglesa a la española por : Antonio López Gómez López [y] Antonio Madrid Vicente. Madrid : A. Madrid Vicente : Mundi-Prensa, D.L. 2003
- BC** Ciencia de la carne y de los productos cárnicos / editado por James F. Price, Bernard S. Schweigert ; traducido por Juan Luis de la Fuente. 2ª ed. Zaragoza : Acribia, 1994
- BC** Ciencia de la leche y tecnología de los productos lácteos / P. Walstra... [et al.] ; traducción de Rosa Mª Oria Almudí. Zaragoza : Acribia, 2001
- BC** El pescado y los productos derivados de la pesca : composición, propiedades nutritivas y estabilidad / coordinador, Adrián Rüter ; traducido por María Luisa Ferrándiz Martín ; revisión científica, Bernabé Sanz Pérez. Zaragoza : Acribia, 1999
- BC** Madrid Vicente, Antonio. El pescado y sus productos derivados / A. Madrid, Juana M. Madrid, R. Madrid. 2a ed. Madrid : AMV : Mundi-Prensa, 1999
- BC** Mountney, George J. Tecnología de productos avícolas / George J. Mountney, Carmen R. Parkhurst ; [traducción realizada por José Fernández-Salguero Carretero... (et al.)]. Zaragoza : Acribia, 2001
- BC** Procesado de frutas / editores, D. Arthey, P.R. Ashurst ; traducido por Justino Burgos González, Carmen Aragón Robles. Zaragoza : Acribia, D.L. 1997
- BC** Procesado de hortalizas / [directores], David Arthey, Colin Dennis. Zaragoza : Acribia, 1992
- BC** Stadelman, William J. Egg science and technology / William J. Stadelman, Owen J. Cotterill. 4th ed., reimp. New York : Food Products Press, 2007
- BC** Tecnología de la carne y de los productos cárnicos / coordinador J.P. Girard ; prólogo C. Valin ; traducido por Carlos Compañé Fernández. [1ª ed.]. Zaragoza : Acribia, D.L. 1991
- BC** Tecnología del procesado del pescado / editor, George M. Hall ; traducido por Reyes Pla Soler, Angels Videla Ces y la colaboración de Monserrat Mor-Mur Francesch. Reimp. de la 2ª ed. en inglés. Zaragoza : Acribia, 2009
- BC** Varnam, Alan H. Carne y productos cárnicos : tecnología, química y microbiología / Alan H. Varnam, Jane P. Sutherland ; traducido por Isabel Jaime Moreno. Zaragoza : Acribia, D.L. 1998

The updated recommended bibliography can be consulted in:
<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28951>