



Universitat de Lleida

DEGREE CURRICULUM **FOOD PACKAGING**

Coordination: SOLIVA FORTUNY, ROBERT CARLES

Academic year 2019-20

Subject's general information

Subject name	FOOD PACKAGING			
Code	102256			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Food Science and Technology	4	OPTIONAL	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	0.8	1.6	3.6
	Number of groups	2	1	1
Coordination	SOLIVA FORTUNY, ROBERT CARLES			
Department	FOOD TECHNOLOGY			
Teaching load distribution between lectures and independent student work	On-site hours: 60 Off-site hours: 90			
Important information on data processing	Consult this link for more information.			
Language	Catalan/Spanish: 90/10			
Office and hour of attention	Robert Soliva Fortuny (coordinator) Center: ETSEA Department: Food Technology Office: 2.1.09.1 Telephone: 973702678			
	Pedro Elez Martínez Center: ETSEA Department: Food Technology Office: 2.1.09.2 Telephone: 973702601			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ELEZ MARTINEZ, PEDRO	pedro.elez@udl.cat	1,9	
MARTIN BELLOSO, OLGA	olga.martin@udl.cat	1,5	
SOLIVA FORTUNY, ROBERT CARLES	robert.soliva@udl.cat	3,4	

Learning objectives

The student must be able to:

- Demonstrate the safety and properties of food exploitation and the different levels of packaging.
- Handle existing legislation related to the packaging and environmental protection materials.
- Demonstrate the following functions and different packaging materials.
- Select and handle the most suitable packaging systems for each food and packaging material.

Competences

General competences

At least the following basic skills will be guaranteed:

CG2: That the students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

CG3: That students have the ability to gather and interpret relevant data to make judgments that include a reflection on relevant social, scientific or ethical issues.

CG4: That students can transmit information, ideas, problems and solutions to a specialized and non-specialized public

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

In addition, the graduate must be able to:

CG6: Analyze specific situations, define problems, make decisions and implement action plans in the search for solutions.

CG7: Interpret studies, reports, data and analyze them numerically.

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

CG9: Use existing IT and communication tools to support the development of your professional activity (strategic competence UdL)

CG10: Work alone and in a multidisciplinary team.

CG11: Understand and express with the appropriate terminology.

CG12: Present information correctly orally and in writing (strategic competence UdL)

CG13: Discuss and argue in various forums.

CG15: Recycle in new technological advances through continuous learning.

CG16: Value comprehensive training, personal motivation and mobility.

CG17: Analyze and assess the social and ethical implications of professional activity.

CG18: Have a critical and innovative spirit.

CG19: Analyze and assess the environmental implications in your professional activity.

Subject contents

Part I. INTRODUCTION TO PACKAGING

Topic 1. Definition of packaging. Current situation of the packaging industry.

Topic 2. Packaging levels. Properties and forms of packaging materials.

PART II LEGISLATION

Topic 3. Legislation on packaging. Packaging and packaging and environment.

PART III METAL CONTAINERS

Unit 4. Nature and characteristics of metallic materials.

Unit 5. Manufacture of metallic containers. New developments.

Unit 6. The closure of metal containers. Evaluation parameters and characteristic defects.

Unit 7. Protection and decoration of metallic materials.

Unit 8. Corrosion problems of metal containers.

PART IV GLASS, PAPER AND CARTON CONTAINERS

Unit 9. Nature and properties of glass for food containers.

Unit 10. Manufacture of glass containers. The closing of the glass containers.

Unit 11. Nature and properties of paper and cardboard for containers and packaging.

PART V. PLASTIC MATERIALS

Unit 12. General characteristics of plastic materials. Relationship between physical structure and polymer properties.

Unit 13. Plastic polymers. Processes for obtaining complex materials. Complex and multilayer films and films.

PART VI PACKING SYSTEMS

Unit 14. Machinery for forming, filling and sealing.

Unit 15. Aseptic packaging. Components and conditions.

Unit 16. Packaging in modified atmosphere. Products of high, medium and low water activity. Practical applications.

PART VII. INNOVATIONS IN FOOD PACKAGING

Unit 17. Biodegradable containers and edible coatings. Properties Constituent substances. Practical applications.

Unit 18. Active packaging. Smart packaging

Practical activities

JOB

Selection of a certain food and analysis of the product at the point of sale (types of packaging and forms of presentation, location in the distribution lines, ...). An evaluation of the material or materials used and the packaging system will be carried out. Special emphasis will be placed on the innovations incorporated and also those applicable to the product in question.

LABORATORY PRACTICAL SESSIONS *

Practice 1. Testing of global migration of plastic materials.

Practice 2. Design and modeling of packaging systems under modified atmosphere.

Practice 3. Analysis of closures in metal containers.

Practice 4. Porosity of metal packaging varnish.

Practice 5. Coating the varnish.

Practice 6. Adhesion of varnish. Test of adhesive tape.

Practice 7. Resistance of varnish to rubbing.

Practice 8. Determination of tin coating.

* It is MANDATORY that students and students wear the following personal protective equipment (PPE) in the course of teaching practices:

UdLunisex white lab coat

Safety glasses

Chemical / biological protection gloves

Methodology

Tipus d'activitat	Descripció	Activitat presencial alumne		Activitat no presencial alumne		Avaluació	Temps total/ECTS
		Objectius	Hores	Treball alumne	Hores	Hores	Hores
Lliçó magistral	Classe magistral (Aula. Grup gran)	Explicació dels principals conceptes	35	Estudi: Conèixer, comprendre i sintetitzar coneixements	52	2	54/3.56
Seminari	Classe participativa (Grup mitjà)	Realització d'activitats de discussió o aplicació	9	Resoldre problemes i casos. Discutir	9	2	20/0.8
Laboratori	Pràctica de Laboratori (Grup mitjà)	Execució de la pràctica: comprendre fenòmens, mesurar...	15	Estudiar i realitzar Examen	15		30/1.2
Activitats dirigides	Treball de l'alumne (individual o grup)	Orientar a l'alumne en el treball (en horari de tutories)	1	Realitzar un treball bibliogràfic, pràctic, etc.	10		11/0.44
Totals			60		86	4	150/6

Development plan

Lectures

These will be taught with the whole group. The aim is to provide a general view of the contents specifically related with the course with emphasis on skills that refer to food processing.

Lab practice

Assistance to this activity is compulsory. Lab practice will be carried out in groups of 3-4 students and will take place in the pilot plant of the food technology department.

Course project

It will be proposed to small groups. Each group will prepare a brief oral exposition and a written document and will have to attend to the scheduled meetings in order to follow up the development of the work.

Evaluation

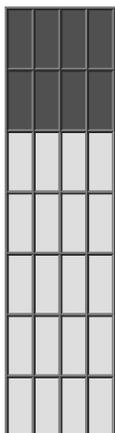
1. **Project: 10%.**
2. **Written test I (individual): 40%.**
3. **Written test II (individual): 40%.**
5. **Lab practice: 10%.**

A memory will be presented. Formal (1/10), bibliographical (2/10) and conceptual (6/10) aspects will be evaluated.

6. **Packaging project activity: 10%.**

Observations

In order to pass the subject, a minimum mark of 5.0 in the written tests is required.



Bibliography

Basic bibliography

BRODY, A.L. Envasado de alimentos en atmósferas controladas, modificadas y a vacío. Ed. Acribia. Saragossa (1996).

COLES, R., McDOWELL, D., KIRWAN, M.J. Food packaging technology. Ed. Blackwell, Boca Raton, EEUU (2003).

LEE, D.S., YAM, K. L. Food packaging, science and technology. Ed. CRC Press, Boca Raton, EEUU (2008).

ROBERTSON, G.L. Food packaging: principles and practice. Ed Marcel Dekker Inc, Nova York, EEUU (1992).

YAM, K.L. The Wiley encyclopedia of packaging technology. Ed. John Wiley & Sons. Hoboken, EEUU (2009).

Additional bibliography

BALDWIN, E.A. Edible coatings and films to improve food quality. Ed Technomic Publ. Co. Inc., Lancaster, EEUU (1994).

BARNES, K.A., SINCLAIR, R., WATSON, D.H. Chemical migration and food contact materials. Ed. Woodhead, Cambridge, UK (2007).

CHIELLINI, E. Environmentally compatible food packaging. Ed. Woodhead, Cambridge, UK (2008).

HAN, J.H. Innovations in food packaging. Ed. Elsevier Academic Press, San Diego, EEUU (2005).

PARRY, R.T. Envasado de los alimentos en atmósfera modificada. A. Madrid Vicente ediciones (1995).

THEOBALD, N., WINDER, B. Packaging closures and sealing systems. Ed. CRC Press. Boca Raton, EEUU (2006).