

## 390445 - DFNP - New Products Design and Formulation

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 Optional) BACHELOR'S DEGREE IN BIOSYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Teaching unit Optional)		
ECTS credits:	6	Teaching languages:	Catalan, Spanish, English

### Teaching staff

Coordinator:	ROSA CARBÓ MOLINER
Others:	ELENA GORDUN QUILES IDOIA CODINA TORRELLA

### Degree competences to which the subject contributes

#### Specific:

1. Food engineering and technology: Engineering and basic operations in food industry. Food technology. Processes in food industry. Management and exploitation of waste. Modeling and optimization. Quality and safety management. Food analysis. Traceability.

### Teaching methodology

The teaching methods used in this course are lectures in which the teacher makes a speech to introduce the basic concepts of the subject and encourages students to participate doing or answering questions, cooperative learning exercises etc. There are also practical sessions so that students acquire lab skills. In order to acquire the lab skills and the knowledge of the foodstuff process, the innovative scientific-technical information must be searched by the students; besides this, they will must do the synthesis and analysis of experimental results.

### Learning objectives of the subject

At the end of the course, the student must be able to:

1. Identify and evaluate the implementation of new trends and ingredients used in the food industry.
2. Apply the current regulations related to the food formulation
3. Develop a new food product formulation
4. To design evaluation tests of the new foodstuff

### Study load

Total learning time: 150h	Hours large group:	0h	0.00%
	Hours medium group:	40h	26.67%
	Hours small group:	20h	13.33%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%



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### Content

<p>(ENG) FASES I DESENVOLUPAMENT DEL DISSENY DE NOUS PRODUCTES ALIMENTARIS</p>	<p>Learning time: 50h Practical classes: 12h Laboratory classes: 8h Self study : 30h</p>
<p>Description:</p> <ol style="list-style-type: none"> <li>1.1. Innovative food concepts, trends and legislation</li> <li>1.2. Introduction to nutritional genomics, nutrigenetics and nutrigenomics</li> <li>1.3. New foods: functional foods, fortified foods, foods without allergens, organic food, genetically modified foods, and others</li> <li>1.4. Experimental design in innovation food</li> </ol> <p>Related activities:</p> <ol style="list-style-type: none"> <li>Activity 1. Participatory exposition sessions</li> <li>Activity 2. Individual assessment tests</li> <li>Activity 3 Innovation study of a new food product</li> </ol>	
<p>(ENG) NOUS INGREDIENTS: EXTRACTES VEGETALS (SENSE FUNCIO PREBIOTICA)</p>	<p>Learning time: 50h Practical classes: 14h Laboratory classes: 6h Self study : 30h</p>
<p>Description:</p> <ol style="list-style-type: none"> <li>2.1. Lipids (omega 3 linolenic acid ...) and fat substitutes</li> <li>2.2. Carotenoids: A and B-carotene, lutein and lycopene</li> <li>2.3. Antioxidants: flavonoids, tocopherols, phenolic acids, phytoestrogens</li> <li>2.4. Amino acids and vitamins: nutritional supplements</li> <li>2.5. Dietary fiber without prebiotic function</li> <li>2.6. Other ingredients</li> </ol> <p>Related activities:</p> <ol style="list-style-type: none"> <li>Activity 1. Participatory exposition sessions</li> <li>Activity 3. Innovation study of a new food product</li> <li>Activity 4. Visit to the company</li> </ol>	

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(ENG) NOUS INGREDIENTS: COMPONENTS  
PREBIÒTICS I MICRORGANISMES PROBIÒTICS

Learning time: 50h

Practical classes: 14h  
Laboratory classes: 6h  
Self study : 30h

### Description:

- 3.1. Getting prebiotics ingredients, probiotics microorganisms and symbiotic foods .
- 3.2. Prebiotics: Inulin, fructo-oligosaccharides and others.
- 3.3. Probiotic microorganisms: Saccharomyces, Bifidobacterium, lactic acid bacteria.
- 3.4. Relationship between prebiotic and probiotic ingredients and the food matrix

### Related activities:

- Activity 1. Participatory exposition sessions
- Activity 2. Individual assessment tests
- Activity 3. Innovation study of a new food product

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### Planning of activities

(ENG) ACTIVITAT 1: CLASSES D'EXPLICACIÓ TEÒRICA	Hours: 90h Practical classes: 38h Self study: 52h
<p>Description: In theoretical classes content of the subject will be presented, and mechanisms for active discussion for students will be established. There will also be seminars with the participation of the productive sector (producers of ingredients, responsible for R&amp;D department)</p> <p>Support materials: Virtual campus, databases, bibliographic material</p> <p>Descriptions of the assignments due and their relation to the assessment: Abstracts, problems and bibliographic works</p>	
ACTIVITY 2: WRITTEN TESTS ASSESSMENT	Hours: 2h Practical classes: 2h
ACTIVITY 3: INNOVATION STUDY OF A NEW FOODSTUFF	Hours: 50h Laboratory classes: 16h Self study: 34h
<p>Description: The innovation of a new food product will be studied by students. A study of developing a new food or modification of some existing food (modified ingredients, formulation) will be proposed. The students will work different stages of development of the food product.</p> <p>Support materials: Virtual campus, databases, bibliographic material, laboratories (microbiology, food, sensory)</p> <p>Descriptions of the assignments due and their relation to the assessment: Delivery of a written report, presentation in class and oral discussion</p>	
(ENG) ACTIVITAT 4: VISITES A EMPRESES	Hours: 8h Laboratory classes: 4h Self study: 4h

### Qualification system

The final qualification,  $N_{final}$ , is the sum of the partial grades:

N1: grades of two written tests

N2: grades of the laboratory sessions and the study of the new food product

N3: grade of the visit

$N_{Final} = N1(0.75) + N2(0.20) + N3(0.05)$

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### Regulations for carrying out activities

The student will receive a calendar with the schedule of activities and delivery of exercises of various activities

### Bibliography

#### Basic:

Espinosa Manfugás, Julia. Evaluación sensorial de los alimentos [on line]. Ciudad de La Habana: Editorial Universitaria, 2007 Available on: <<http://site.ebrary.com/lib/cbuc/docDetail.action?docID=10179643>>. ISBN 9789591605399.

Cortés, Claudia. Modificando la textura de los alimentos : manual de uso de los hidrocoloides. [Madrid]: Vivelibro, 2016. ISBN 9788416875498.

#### Complementary:

Burdock, George A.; Fenaroli, Giovanni. Fenaroli's handbook of flavor ingredients. 6th ed. Boca Raton: CRC Press, 2010. ISBN 9781420090772.

Chadwick, Ruth F. Functional foods. Berlin [etc.]: Springer, 2003. ISBN 3540201203.

Meulenbergh, M. T. G.; Jongen, W. M. F. Innovation of food production systems : product quality and consumer acceptance. Wageningen: Wageningen Pers, 1998. ISBN 9074134513.

Ingredient interactions : effects on food quality. 2nd ed. New York [etc.]: CRC, 2006. ISBN 0824757483.

Watson, Ronald R. Complementary and alternative therapies in the aging population [Rekurs electrònic] [on line]. Amsterdam ; Boston: Academic Press/Elsevier, 2009 [Consultation: 18/04/2018]. Available on: <<https://www.sciencedirect.com/science/book/9780123742285>>. ISBN 9780080921242.

Smith, Jim; Charter, Edward. Functional food product development. Chichester, West Sussex ; Ames, Iowa: Blackwell, 2010. ISBN 9781405178761.