Course guide
390445 - DFNP - New Product Design and Formulation

Last modified: 25/01/2024

Unit in charge: Barcelona School of Agri-Food and Biosystems Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: BACHELOR'S DEGREE IN BIOSYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: M.ISABEL ACHAERANDIO PUENTE

Others: EVA DURAN

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. Know the bases of Innovation in the Food Industry and the related methodology
2. Identify and evaluate the implementation of new trends and ingredients used in the food industry.
2. Apply the current regulations related to food formulation
3. Have knowledge of the new food product formulation
4. Design evaluation tests of the new food product

STUDY LOAD

Type	Hours	Percentage
Hours small group	20,0	13.33
Self study	90,0	60.00
Hours medium group	40,0	26.67

Total learning time: 150 h

CONTENTS

(ENG) FASES I DESENVOLUPAMENT DEL DISSENY DE NOUS PRODUCTES ALIMENTARIS

Description:
1.1. Innovative food concepts, trends and legislation
1.2 Basis on the food industry innovation strategies
1.3. Introduction to nutritional genomics, nutrigenetics and nutrigenomics
1.4. New foods: functional foods, fortified foods, foods without allergens, organic food, genetically modified foods, and others
1.5. Experimental design in innovation food

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

Full-or-part-time: 50h
Practical classes: 12h
Laboratory classes: 8h
Self study : 30h

(ENG) NOUS INGREDIENTS: EXTRACTES VEGETALS (SENSE FUNCIÓ PREBIÒTICA)

Description:
2.1. Lipids (omega 3 linolenic acid ...) and fat substitutes
2.2. Carotenoids: A and ß-carotene, lutein and lycopene
2.3. Antioxidants: flavonoids, tocopherols, phenolic acids, phytoestrogens
2.4. Amino acids and vitamins: nutritional supplements
2.5. Dietary fibber without prebiotic function
2.6. Other ingredients

Related activities:
Activity 1. Participatory exposition sessions
Activity 3. Innovation study of a new food product
Activity 4. Laboratory practices and solving innovations excercices of a new product

Full-or-part-time: 50h
Practical classes: 14h
Laboratory classes: 6h
Self study : 30h

(ENG) NOUS INGREDIENTS: COMPONENTS PREBIÒTICS I MICRORGANISMES PROBIÒTICS

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

Full-or-part-time: 50h
Practical classes: 14h
Laboratory classes: 6h
Self study : 30h

ACTIVITIES

(ENG) ACTIVITAT 1: CLASSES D'EXPLICACIÓ TEÒRICA

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&D department

Material:
Virtual campus, databases, bibliographic material

Delivery:
Abstracts, problems and bibliographic works

Full-or-part-time: 90h
Practical classes: 38h
Self study: 52h

ACTIVITY 2: WRITTEN TESTS ASSESSMENT

Full-or-part-time: 2h
Practical classes: 2h

ACTIVITY 3: INNOVATION STUDY OF A NEW FOODSTUFF

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.

Material:
Virtual campus, databases, bibliographic material, laboratories (microbiology, food, sensory)

Delivery:
Delivery of a written report, presentation in class and oral discussion

Full-or-part-time: 40h
Laboratory classes: 11h
Self study: 29h

ACTIVITY 4: LABORATORY PRACTICES AND SOLVING INNOVATION EXCERCICES OF A NEW PRODUCT

Description:
Aspects of food innovation product related to physicochemical and sensory characteristics will be worked on

Full-or-part-time: 18h
Laboratory classes: 9h
Self study: 9h

GRADING SYSTEM

The course grade (NFinal) will be calculated as:
N1: Individual test
N2: Seminars
N3: Lab sessions
N4: Group report (manuscript + oral presentation)
NFinal= 0.35N1 + 0.15N2 + 0.15N3 + 0.35N4

EXAMINATION RULES.

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 [Consultation: 16/07/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=3174839. ISBN 9789591605399.
- Cortés, Claudia. Modificando la textura de los alimentos : manual de uso de los hidrocoloides. [Madrid]: Vivelibro, 2016. ISBN 9788416875498.

Complementary:
- Ingredient interactions : effects on food quality. 2nd ed. New York [etc.]: CRC, 2006. ISBN 0824757483.
- Burdock, George A.; Fenaroli, Giovanni. Fenaroli's handbook of flavor ingredients. 6th ed. Boca Raton: CRC Press, 2010. ISBN 9781420090772.
- Watson, Ronald R. Complementary and alternative therapies in the aging population [Recurs electrònic] [on line]. Amsterdam ;

Boston: Academic Press/Elsevier, 2009 [Consultation: 16/07/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780123742285/complementary-and-alternative-therapies-and-the-aging-population. ISBN 9780080921242.
- Smith, Jim; Charter, Edward. Functional food product development. Chichester, West Sussex ; Ames, Iowa: Blackwell, 2010. ISBN 9781405178761.
- Chadwick, Ruth F. Functional foods. Berlin [etc.]: Springer, 2003. ISBN 3540201203.
- Meulenberg, M. T. G.; Jongen, W. M. F. Innovation of food production systems : product quality and consumer acceptance. Wageningen: Wageningen Pers, 1998. ISBN 9074134513.