

COURSE: Food Product Development			
ACADEMIC YEAR: 2019-2020			
TYPE OF EDUCATIONAL ACTIVITY: Characteristic			
TEACHER: Fernanda Galgano			
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phone: +39-0971-20-5570		mobile (optional): +39-320-4371255	
Language: English			
ECTS: 6 (5 Lectures + 1 practical/numerical exercises and technical visits)	n. of hours: 56 h (40h lessons and 16h numerical exercises and technical visits)	Campus: Potenza Dept./School: School of Agriculture, Forest, Food and Environmental Sciences Program: MSc in Food Science and Technology	Semester: 1

### EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

This is an advanced course in Food Product Development. The objective of this course is to provide students the required knowledge and skills needed for understanding the processes involved in the invention process, formulation, and development of new food products, as well as to enhance team cooperation and communication skills. The course will require the integration of scientific principles of food science and food technology and the use of problem-solving skills to address a specific project development objective from concept to finished product.

- **knowledge and understanding:** Knowledge and understanding of the relationships and interactions among the various ingredients and the technical steps required to obtain a desired product. Capability to manage complex and innovative food production processes, with the aim to solve problems related to technological aspects, as well as to quality and shelf-life characteristics of food and plant sanitation aspects. Knowledge and comprehension of the aspects related to food product development taking also into account the process sustainability. Knowledge and comprehension of the aspects related to consumer science.
- **applying knowledge and understanding:** ability to get an overall picture of the problematics involved in the development of a new food product, taking into account technical and economic issues, as well the eco-sustainability (e.g. carbon footprint, water footprint) issues; ability to identify the real possibility of introducing a new product on the market taking into account also the economic and technical characteristics of the industry that shall produce and sell it.
- **making judgements:** ability to identify the most effective technical solutions to develop a new product taking into account also economic and scale-up problematics involved in the production steps.
- **communication skills:** development of verbal and written skills to define, discuss, justify, and outline a scientific approach and communicate research findings. Ability to work and interact with individuals from diverse cultures and work effectively with others, dealing with individual and/or group conflict. Ability to interact and communicate with food business operators, marketing specialists and representative of companies involved in the development process. Ability to communicate with representative of food safety agencies, official control agencies and quality certification agencies in all the steps needed for the registration and approval of a new food product and during food quality and safety audits. Students will demonstrate the acquired written and oral communication skills through the completion of assignments, such as the preparation and presentation to their colleagues of a PowerPoint presentation.
- **learning skill:** Ability of data mining to access all the information needed for a successful development of a new product. These include, but are not limited to, scientific and technical data, marketing data, economic data.

### EXPECTED LEARNING OUTCOMES

At the end of this course, the students have to be able to know:

- how to apply and incorporate the principles of food science in practical, real-world situations
- how to define a problem, identify potential causes and possible solutions, and make thoughtful recommendations.
- how to integrate food chemistry, food microbiology, food processing and engineering concepts
- how to use sensory analysis and to apply statistical principles for food product development

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### PRE-REQUIREMENTS

To understand the material presented in this course the following knowledges and skills are needed :

- basic knowledge of mathematics, physics, inorganic and organic chemistry.
- basic knowledge of food chemistry, food unit operations and food processing technology
- basic knowledge of statistics
- basic skills in using word processor and spreadsheet programs
- English language skills ( $\geq$  B2)

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### SYLLABUS

The course is organized in 6 teaching units. Starting from the presentation of real problems/products the various topics/issues will be proposed to the students.

**Unit 1.** Review of syllabus and course objectives. Corporate Organization of Food Companies. The Product Development Process. Ideation and evaluation of ideas. Role of Research & Development.

**Unit 2.** Optimization in formulation and/or in processing of a new product to address quality issues.

**Unit 3.** Consumer acceptability of food products and concepts in consumer science.

**Unit 4.** Legal Issues in Product Development. Quality Control and HACCP.

**Unit 5.** Stability Testing of Foods.

**Unit 6.** Technical visits to food industries. Guided simulation to the practical development of a new food product.

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### TEACHING METHODS

The course includes 40 h devoted to lectures and 16 h devoted to practical work (visits to food industries, practical assignments). In order to stimulate the active participation of the students attending the course, at the beginning of each lecture one of the student will be asked to summarize the content of the previous lecture and to answer to any doubt/question that the other students may have.

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### EVALUATION METHODS

The aim of examination is to verify the student achieved skills as previously listed.

The examination consists of an oral test designed to assess the student's ability to connect and compare different aspects covered during the course, through three questions each with a maximum grade of 10/30. To pass the test, it is necessary to provide correct answers to at least 2 questions on the 3 formulated. It is also foreseen the preparation of an in-depth written paper on a topic, previously agreed with the teacher, treated during the course and in the oral discussion with preparation of a Power Point in the classroom. The overall evaluation will also take into account the paper presented in the classroom (1 grade).

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### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Some course material and handouts will be provided during the course. Teaching material is provided punctually to students, even through a shared web folder. However the students are strongly encouraged to utilize the suggested textbooks:

- Fuller G.W. (2011). New Food Product Development: From Concept to Marketplace, Third Edition. CRC Press. ISBN-13: 978-1439818640
- Fellows J.P (2016). Food Processing Technology: Principles and Practice. Woodhead Publishing. ISBN-13: 978-0081019078.
- Linnemann A.R., C. G. P. H. Schroen C.G.P.H. (2011). Food Product Design: An Integrated Approach. Wageningen Academic Pub. ISBN-13: 978-9086861736.
- Moskowitz H.R., Beckley J.H., Resurreccion A.V.A. (2012). Sensory and Consumer Research in Food Product Design and Development. Blackwell Pub. ISBN-13: 978-0813813660.
- Moskowitz H.R., Porretta S., Silcher M. (2005). Concept Research in Food Product Design and Development. Wiley-Blackwell. ISBN-13: 978-0813824246.
- Hu, R. FOOD PRODUCT DESIGN - A COMPUTER-AIDED STATISTICAL APPROACH. CRC Press. ISBN-13: 978-1566767439.

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### INTERACTION WITH STUDENTS

Initially the students' skills and knowledge will be evaluated by using a written test so to organize at the best the structure of the course. The structure, aim and content of the course will be illustrated during the first lesson, as well as the exam format and the evaluation procedure. Information will also be given about the planned visit to selected food industries. The list of text books will be given and throughout the course some reference material will be distributed. Related documents in electronic format will be available on a document cloud accessible to the students.



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The students who will attend assiduously the course are asked for their surname, name, telephone number, registration number and E-mail.

The lecturer will be available to receive students on Monday (16.20-18.30), Wednesday (11.30 13.30) and Tuesday (16.30-18.30) in her study and/or even in other days, preferably after an E-mail contact. Moreover, students will have the possibility to interact with the lecturer by Skype.

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**EXAMINATION SESSIONS (TENTATIVE)<sup>1</sup>**

20/02/2020, 19/02/2020, 16/04/2020, 14/05/2020, 11/06/2020, 9/07/2020, 17/09/2020, 15/10/2020, 12/11/2020, 10/12/2020, 14/01/2021, 18/02/2021.

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**EVALUATION COMMITTEE**

Prof. Fernanda Galgano (president), Dr. Marisa Carmela Caruso (member), Dr. Nicola Condelli (replacement member)

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**SEMINARS BY EXTERNAL EXPERTS**      YES X    NO

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**FURTHER INFORMATION**

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<sup>1</sup> Subject to possible changes: check the web site of the Teacher or the Department/School for updates.