



Code: ING-IND/25

Credits: 9

Course: Food Design and Formulation

Main language of instruction: Italian

Other language of instruction: English

Teaching Staff

Head instructor

Prof. Andrea BUDELLI- andrea.budelli@unicusano.it

Introduction

1. Objective of the course :

The Food Design and Formulation course aims to give the student a good understanding of the process of developing a new Food Product. The course aims to provide the basic knowledge to be able to deal with issues related to the development of a product manufacturing process or a food product change process. Hints will be given regarding the composition and structure of foods, their packaging and labels, a detailed description of all stages of development of a new food product will be given. Activity associated with the course develop the skills needed to formulate food design and formulation problems through reasoned exercises.

Objectives

2. Course Structure:

The Food Design and Formulation course has the following educational objectives:

1. To provide the general principles of the process of developing a new food product
2. To provide the detailed description of the stages of development
3. Provide the basics related to the composition and structure of foods of their packaging and labels
4. Provide the main tools specific to a food product development or change process
5. Provide specific insights to current issues related to development activities.

Competencies:

A. Knowledge and understanding:

The student at the end of the Course will have demonstrated knowledge of the principles of food formulation and the structure and content of a product brief. In addition, the student will acquire knowledge of the main financial elements and the fundamentals of project management. Finally, the student will acquire methods to learn the basic technical elements in food product design and the terminology inherent in food product development. In addition, through Etivity, students will acquire the ability to apply theoretical concepts in practice with particular reference to the preparation of a product brief, formulation, label and packaging.

B. Applying knowledge and understanding:

The student will be able to use knowledge of Food Design and Formulation to define a Project Plan for food development; the student will also be able to design a production process, determine an industrial cost and simulate a cross functional team. Etivity involve the application of theoretical knowledge to practical problems to be solved.

C. Making judgements:

The student will be able to identify the most appropriate models for describing the individual functional blocks for preparing a Product Brief, prepare an appropriate label, define the appropriate packaging, and determine the corresponding industrial cost.

D. Communication skills:

The student will be able to describe and sustain conversations about typical problems in food formulation, food development, and project management, correctly identifying relevant parameters, and using appropriate terminology.

E. Learning skills:

The student at the end of the Course will have knowledge of the fundamentals necessary for the analysis of food systems. All this will enable student to pursue engineering studies with greater maturity and will provide with the basis for being able to learn what will be offered in specialized agribusiness courses, with particular reference to the topics of "food formulation and design".



Syllabus

3. Programme of the course:

Subject 1 – Principles of Food Design and Formulation

- General principles in food design and formulation
- Critical commercial elements
- Critical technical element
- Critical industrial and financial elements
- Critical legislative elements

Subject 2 – The Product Brief

- The Commercial Brief
- The Technical Brief
- The Profit and Loss Statement of a Food Product

Subject 3 - The Food Product Development Process

- The Stage and Gate model
- The definition of strategy
- Product design and development
- Portfolio Management

Subject 4 – Technical Elements of Design

- Food Regulations
- Nutritional Design
- Food Ingredients
- The "Formula" or "Recipe" of a food
- Packaging of a Product
- Production Processes

Subject 5 – Principles of Project Management

- The Role of the Project Manager
- Development Phase Planning
- Project Management Tools
- Fundamental Principles of Project Management

Subject 6 – Insights: Principles of Food Hygiene and Safety

- Food Safety
- HACCP

- ISO 22000

Subject 7 – Insights: Product Innovation

- Definition of Product Innovation
- Sources of Innovation and Ideas
- Innovation Risks and Opportunities

Evaluation system and criteria

The examination consists of an oral or written test.

In addition, the E-tivity, consisting of numerical problems. These need to be sent to the instructor in advance of the examination. E-tivity counts a total of 4 marks.

Bibliography and resources

4. Materials to consult

Notes written by the instructor are available in Italian.

5. Recommended bibliography

Suggested readings are:

- L. Piergiovanni, S. Limbo, “Food packaging”, Springer-Verlag Italia, 2010.
- Stone & Sidel, “Sensory Evaluation Practices”, Burlington Academic Press, 2004.
- Gibney M.J., Vorster H., & Kok. “Introduction to Human Nutrition”. Blackwell publishing.
- Aurand, L. W. (Ed.). “Food composition and analysis”. Springer Science & Business Media, 2013.
- Cappelli P, Vannucchi V., “Chimica degli alimenti – Conservazione e trasformazione”. Zanichelli, 2016.
- Cappella P, Fedeli E, Bonaga G, Lerker G. “Manuale degli oli e dei grassi”. Tecniche Nuove, 1997