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|------------------|--------------------------------|---------------|----------------|------------------|---------------------|
| Course Unit | Food Technology and Innovation | | Field of study | Food Industries | |
| Bachelor in | Dietetics and Nutrition | | School | School of Health | |
| Academic Year | 2023/2024 | Year of study | 2 | Level | 1-2 |
| Type | Semestral | Semester | 1 | Code | 8149-807-2106-00-23 |
| Workload (hours) | 108 | Contact hours | T - | TP 22,5 | PL 30 |
| | | | TC - | S - | E - |
| | | | OT 7,5 | O - | |

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Elsa Cristina Dantas Ramalhosa

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Identify the main food technologies used in food industries;
2. Know the physical and chemical food parameters involved in food processing;
3. Understand the reactions where food components are involved.
4. Know the different types of innovation.

Prerequisites

Before the course unit the learner is expected to be able to:
Apply knowledge and abilities acquired in Biochemistry, Food Chemistry and Nutrition.

Course contents

Identification of the main food characteristics with great importance in food processing. Knowledge on the modifications involved in food processing, in terms of chemical, sensorial and nutritional characteristics. Knowledge on the main food technologies, namely those involving: application or removal of heat; pH, atmosphere and water activity modification; emerging technologies; transformation operations. Examples. Innovation.

Course contents (extended version)

1. Concept and Objectives of Food Technologies
 - Origin /evolution of food processing
 - Objectives of food technologies
2. Fresh goods
 - Alteration of fresh goods
 - Strategies on food conservation and transformation
 - Adulterated and contaminated foods
3. Heat treatments
 - Death kinetic of microorganisms by heat
 - Types of thermal treatments: Bleaching, Pasteurization and Sterilization
4. Treatments involving Cold
 - Refrigeration
 - Freezing
 - Defrosting
5. Preservation treatments involving pH, atmosphere and water activity modification
 - Influence of pH in microorganisms
 - Controlled and modified atmospheres
 - Dehydration: Drying and Lyophilization
6. New Technologies
 - Non-Ionizing Electromagnetic Radiations
 - Ionizing Electromagnetic Radiations
 - High Hydrostatic Pressures
7. Transformation Operations
 - Texture modification
 - Extrusion
8. Practical Applications
9. Innovation
 - Types of innovation: Product, Process, Marketing and Organizational.
 - Importance of Innovation

Recommended reading

1. Ordóñez J. A. (2005), Tecnologia de Alimentos, Artmed Editora, Porto Alegre (Brasil).
2. Singh R. P., Heldman D. R. (2009), Introduction to Food Engineering, 4th Ed., Academic Press.
3. Banzoff C. (2017), Food Technology, Mason Crest Publishers (Ed.).
4. Jeantet R., Croguennec T., Schuck P., Brule G. (2016), Handbook of Food Science and Technology, Iste Ltd and John Wiley & Sons Inc. (Ed.)
5. Negas M.C., Carvalho L.C., Dias de Sousa I. (2020), Inovação e Tecnologia – Uma Visão Multidisciplinar, Edições Silabo.

Teaching and learning methods

Theoretical and Practical lessons - themes exposition by slides (data-show). Analysis of practical cases. Realization of experiments in the laboratory; Tutorial guidance - help the students on problems resolution about the addressed matters.

Assessment methods

1. 1st Option - (Regular, Student Worker) (Final)
 - Intermediate Written Test - 85% (- Three tests along the semester.)
 - Development Topics - 15% (Case study discussion and exercises resolution.)
2. 2nd Option - (Regular, Student Worker) (Final, Supplementary, Special)
 - Final Written Exam - 85% (- Written final exam.)
 - Development Topics - 15% (Case study discussion and exercises resolution.)
3. 3rd Option - (Student Worker) (Final, Supplementary, Special)
 - Final Written Exam - 100% (- Written final exam.)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

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|--------------------------------|--------------------------|---------------------------------|---------------------------------------|
| Elsa Cristina Dantas Ramalhosa | Juliana Almeida de Souza | Luis Migue Fernandes Nascimento | Adília Maria Pires da Silva Fernandes |
| 13-11-2023 | 08-02-2024 | 08-02-2024 | 08-02-2024 |