

Course Unit	Food Technology	Field of study	Food Industries
Bachelor in	Dietetics and Nutrition	School	School of Health
Academic Year	2022/2023	Year of study	3
Type	Semestral	Semester	1
Level	1-3	ECTS credits	5.0
Code	8149-501-3205-00-22		
Workload (hours)	135	Contact hours	T - TP 30 PL - TC 15 S - E - OT 15 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.

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.

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

Recommended reading

1. Ordóñez J. A. (2005), Tecnologia de Alimentos, Artmed Editora, Porto Alegre (Brasil).
2. Singh R. P. , Heldman D. R. (2001), Introduction to Food Engineering, 3rd Ed. , Academic Press.
3. Trautler H. , Coleman B. , Hofmann K. (2014). Food Industry Design, Technology and Innovation, John Wiley & Sons, Inc.
4. Knoerzer K. , Juliano P. , Smithers G. W. (2016), Innovative Food Processing Technologies, Woodhead Publishing.
5. Belitz H. D. , Grosch W. , Schieberle P. (2004), Food Chemistry, 3rd edition, Springer-Verlag.

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

Elsa Cristina Dantas Ramalhosa	Vera Alexandra Ferro Lebres	Juliana Almeida de Souza	Adília Maria Pires da Silva Fernandes
27-10-2022	08-11-2022	03-01-2023	07-01-2023