Course Unit	Food and Water Analisys			Field of study	Biomedical Laboratory Sciences								
Bachelor in	Biomedical Laboratory Sciences			School	School of Health								
Academic Year	2023/2024	Year of study	2	Level	1-2	ECTS credits	5.0						
Type	Semestral	Semester	1	Code	9995-804-2101-00-23								
Workload (hours)	135	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): Andrea Luisa Fernandes Afonso, Roberto Alexandre Crisante da Costa

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Have knowledge about the most important parameters in chemical and microbiological analysis of water and food.
2. Evaluate and interpret the results compared to the current law and understand the importance of research in Public Health.
3. Provide students the expertise necessary to develop laboratory work evaluation and control of chemical and microbiological quality of water and foods.

Prerequisites

Before the course unit the learner is expected to be able to:
None

Course contents

1 - Importance of water 2 – Legislation and Analysis of Various Types of Water and Food 3 - Chemical Contamination of Water and Food 4 - Microorganisms Responsible for Water/Food Contamination 5 - Microbial Ecology of Food 6 - Food Quality and Safety 7 - Microbiological and Chemical Analysis of Water and Food

Course contents (extended version)

1. Public health
   - Application areas - food and water.
2. Water quality and regulations applied to different types of water
   - Quality of water - origin, general composition, pollution and treatment.
   - Existing legislation for different types of water.
   - Evaluation of drinking-water quality.
   - Evaluation of swimming pools water quality.
   - Evaluation of the quality of bathing water. .
   - Quality of natural mineral water, spring water, bottled drinking water.
   - Sampling.
3. Chemical contamination of water and food
   - Physical-chemical contaminants of water.
   - Chemical contaminants of food.
4. Microbial contamination of water and food
   - Infections food, food poisoning and other foodborne diseases.
   - Main microorganisms responsible for diseases and foodborne illness.
   - Main microorganisms responsible for food poisoning.
   - Contaminantes of non-enteric origin
5. Microbial Ecology of Food
   - Microorganisms responsible for technological changes desirable.
   - Factors responsible for the deterioration of food.
   - Sources of microorganisms contaminants: soil, water, air, plants, animals, man.
   - Factors that determine the growth and survival of microorganisms in food.
   - Microbial contamination of food products (dairy, meat, fisheries, crops).
   - Conservation of food.
6. Quality and safety of food
   - Laboratorial analysis of water and food.
   - Legislation and food hygiene.
   - Principles of HACCP (Hazard Analysis of Critical Control Points).
7. Practical classes
   - Laboratory of chemical and microbial analysis of water and food samples.
   - Chemical analysis of drinking water, swimming water and mineral water.
   - Chemical analysis of food.
   - Indicators microorganisms of contamination or inefficiency of water disinfection.
   - Microbiological analysis of drinking water, swimming water, mineral water and termal water.
   - Assessment of cleaning hands and utensils in food handling.
   - Sampling for analysis

Recommended reading

1. James M. Jay, Martin J. Loessner, David A. Golden (2006). Modern Food Microbiology. (7th Edition). New York: Springer-Verlag Inc.
2. Mendes, B. , Oliveira, J. F. S. (2004). Qualidade da água para consumo humano. Lisboa: Lidel, edições técnicas, Lda.
3. Rice, E. W. , Baird, R. B. , Eaton, A. D. (2017). Standard Methods for Examination of Water and Wastewater. (23th Edition). Washington, DC: American Public Health Association.

Teaching and learning methods

Expositive, active and participative classes

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Final Written Exam - 50%
   - Practical Work - 50%
2. Alternative 2 - (Regular, Student Worker) (Supplementary, Special)

Assessment methods

- Final Written Exam - 50%
- Final Written Exam - 50%

3. Alternative 3 - (Student Worker) (Final)
   - Final Written Exam - 50%
   - Final Written Exam - 50%

Language of instruction

Portuguese

Electronic validation

Andrea Luisa Fernandes Afonso, Roberto Alexandre Crisante da Costa	Antonio Jose Madeira Nogueira	Luis Migue Fernandes Nascimento	Adília Maria Pires da Silva Fernandes
04-01-2024	04-01-2024	04-01-2024	04-01-2024