

Introduction to Food Science (O000130)

Course size (nominal values; actual values may depend on programme)

Credits 5.0 Study time 150 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2019-2020

A (semester 2)	English	group work	30.0 h
		lecture	30.0 h

Lecturers in academic year 2019-2020

Van Haute, Sam	KR01	lecturer-in-charge
Cirkovic Velickovic, Tanja	KR01	co-lecturer

Offered in the following programmes in 2019-2020

	crdts	offering
Bachelor of Science in Environmental Technology	5	A
Bachelor of Science in Food Technology	5	A
Bachelor of Science in Molecular Biotechnology	5	A
Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology	5	A

Teaching languages

English

Keywords

Food science; food industry; food processing

Position of the course

This course introduces students to the basic concepts of food science and underlying technology associated with providing a safe, nutritious, and abundant supply of fresh and processed food to humans. The course aims at providing information regarding the basic chemical, physical, and microbiological aspects of food and the integration of basic sciences in the food industry. Students will examine the scientific, technical, and practical aspects involved with the storage, processing, preservation, and packaging of food products.

Contents

Global food situation (important food commodities/raw materials, international trade,...), Careers in Food Science and Technology
 Food categories and composition
 Food quality and the food chain approach from farm to fork
 Food and health, nutritional value, labelling.
 Food Chemistry basis, functional groups and properties, water and acids, carbohydrates, lipids, proteins, colors, flavors, texture...etc.
 Food processing (1) for preservation, (2) for reformulation (animal and non-animal products).
 Food microbiology and safety, fermentation
 Trends in the food industry (such as Clean label, mild processing, ...)
 Casestudies—a number of case studies will be given based on foods typical for the Korean market (e.g. soymilk, egg noodles, Kimchi...etc.)

Initial competences

Basic knowledge of inorganic and organic chemistry, biochemistry, general microbiology is required.

Final competences

1 Understand the basic principles of food science and gain an appreciation of the scope and breadth of the field of Food Science

- 2 Know the different food commodities and their compositions
- 3 Improve understanding of fundamental chemistry of foods and the major molecular components of foods including proteins, carbohydrates & lipids
- 4 Understand different food processing methods and examine their effect on quality of foods
- 5 Understand different methods used for food preservation and their applications in retaining quality of food
- 6 Discuss the microbiology of different foods and hazards present in different food and their safety
- 7 Utilize oral and written skills to communicate thoughts, information and solution to food science and technology issues

Conditions for credit contract

Access to this course unit via a credit contract is unrestricted: the student takes into consideration the conditions mentioned in 'Starting Competences'

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, lecture

Extra information on the teaching methods

Course project

1. Objectives

Describe and discuss an industrial food process. By the end of the project, student should be able to:

- Understand the basic principles of food science and gain an appreciation of the scope and breadth of the field of Food Science.
- Understand the fundamental chemistry of foods and their major molecular components including proteins, carbohydrates and lipids.
- Understand different food processing methods and examine their effect on food quality.
- Understand the safety of foods and identify the major food hazards

2. Guidelines

- Consider: Quality, safety, nutritional value, convenience & sensory properties
- Different unit processes should be included in the process: process flowchart
- Inclusion of an innovative unit process is highly recommended

3. Different tasks

- Choose a food product: from the hypermarket, complex food product or meal, typical for the Korean market (soy milk, Egg noodles, Kimchi...etc.) or other typical foods.
- Description of the product: Food product name, type of package, ingredients, nutritional value, storage conditions, ...etc.
- Process Flow chart: use ISO symbols
- Justify each step in the flowchart: description of the unit operation (freezing, drying, cooking...etc.) including the process parameters (if available - temperature, time, pressure...etc.)
- Quality and sensory properties of the selected food product: description of the quality characteristics
- Safety of the food product: preservation, spoilage microorganisms, HACCP

Learning materials and price

- 1 Atkins, P.J. and Ian Bowler, 2001: Food in society, economy, culture, geography , Edward Arnold, London, UK.
- 2 Food Science and Technology, Edited by Geoffrey Campbell-Platt, ISBN 978-0-632-06421-2
- 3 Murano, P.S. 2003. Understanding Food Science and Technology" Thomson Learning, London U.K.
- 4 Shewfelt, R. L. Introducing Food Science. 2009, CRC Press, ISBN 978-1587160288

References

- 1 John D. Floros, Rosetta Newsome, William Fisher and others (2010) Feeding the World Today and Tomorrow: The Importance of Food Science and Technology. *Comprehensive review in Food Science and Food Safety*, 9:571-599. doi 10.1111/j.1541-4337.2010.00127.x

Course content-related study coaching

Interactive counselling through Minerva. Individual electronic appointment booking.

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions, written examination with multiple choice questions

Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions, written examination with multiple choice questions

Examination methods in case of permanent evaluation

Oral examination, participation, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

Course project :

- Report: description of the selected food product including the nutritional facts, processing flowchart, detailed major unit operations, quality and safety of the final product
- Oral presentation : group presentation of the findings (nutrition, processing, quality and safety)

Calculation of the examination mark

Final Written Examination	50%
Written examination with multiple choice questions (Quizzes)	20%
Term Project (Report + Oral)	20%
Participation	10%