

Food Chemistry Course Outline

General

SCHOOL	Agricultural Sciences		
DEPARTMENT	Food Science and Nutrition		
ACADEMIC LEVEL	Undergraduate		
COURSE CODE	MK512	SEMESTER	5 th
COURSE TITLE	Food Chemistry (Instructor: S. Lalas)		
INDEPENDENT TEACHING ACTIVITIES <i>In case credits are awarded separately for different parts of the course (e.g., Lectures, Laboratory Exercises, etc.), if credits are awarded as a whole for the entire course, specify the weekly teaching hours and the total credits.</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	6
Laboratory Exercises		3	
COURSE TYPE Background, General Knowledge, Scientific Area, Skill Development	Skill development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATION:	Greek		
COURSE OFFERED TO ERASMUS STUDENTS:	Yes		
COURSE WEBSITE (URL):	-		

LEARNING OUTCOMES

Learning Outcomes
<p>The course aims to provide a comprehensive understanding of the chemical reactions that occur during the processing, storage, and cooking of food. Furthermore, it seeks to impart knowledge regarding the selection of methods and conditions to either prevent undesirable changes or promote desired transformations in food products. Lastly, the course endeavors to equip students with the ability to apply appropriate methods for food analysis, with the goal of verifying their identity (authenticity) or assessing their quality.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Understand the structure, chemical, and physicochemical properties of carbohydrates, their detection and differentiation, caramelization, reactions causing food browning, and the significance of important carbohydrate-rich foods. • Comprehend the structure and chemical properties of lipids, the extraction and analysis of lipids from plant and animal tissues, and their role in human nutrition. • Grasp the structure of amino acids, peptides, and proteins, their functional and chemical properties, the Maillard reaction (including individual reactions, control, and inhibition), and the role of proteins in human nutrition. • Familiarize themselves with vitamins, their chemical structure, nomenclature, sources, and the effects of food processing on their stability. • Gain knowledge about food additives, food microconstituents, novel foods, and food substitutes. • Understand the chemical changes that occur during the processing, storage, and cooking of foods. • Identify undesirable substances in food, such as dioxins, enzymatic browning, and methods for controlling enzymatic browning. • Explore the sensory aspects of food, including taste, flavor compounds, aftertaste, flavor modification, aroma, and chemical structure, as well as the determination of taste and aroma.

- Learn how to correlate analytical data with the properties of foods, as well as with their quality and safety.

Furthermore, upon completing the course, students will be capable of effectively communicating information, problems, and solutions to both specialized and non-specialized personnel.

General Skills

Search, analysis, and synthesis of data and information using the necessary technologies, Decision-making, Autonomous work, Teamwork, Critical thinking, Theoretical thinking, and the ability to translate theory into practice.

Course Content

- 1st Week:** Introduction - Safety Issues
2nd Week: Properties of Carbohydrates
3rd Week: Non-enzymatic Browning I: Caramelization
4th Week: Properties of Proteins
5th Week: Non-enzymatic Browning II: Maillard Reaction
6th Week: Enzymatic Browning in Foods
7th Week: Dairy Products
8th Week: Food Thickening
9th Week: Determination of Lipids
10th Week: Food Micronutrients (Vitamins and Trace Elements)
11th Week: Food Additives
12th Week: Food Substitutes
13th Week: Food Adulteration

Teaching and Learning Methods - Evaluation

Teaching Method	Face-to-Face or Distance Learning	
Use of Information and Communication Technologies	YES. The course lectures are supported by electronic slide presentations and other audio-visual materials. Supplementary notes are posted on the E-Class platform.	
Teaching Organization - Workload Activities of the Semester	Activity	Workload
	Lectures	39
	Laboratory exercises	39
	Self-study	72
	Total Course Workload (25 hours of workload per credit):	150
Student Assessment	<p>Examination Language: Greek.</p> <p>Students have access to supplementary notes posted on E-Class, but they also receive a textbook of their choice from those available in the EUFOXUS system.</p> <p>The final grade for the course is determined by 50% from the assessment of the theoretical part (lectures) and 50% from the laboratory exercises. The exams (Theoretical and Laboratory parts) include multiple-choice questions. Specifically: Written examination with multiple-choice questions in the case of in-person assessment. Electronic examination through E-Class with multiple-choice questions in the case of distance assessment.</p>	

RECOMMENDED BIBLIOGRAPHY

- Recommended bibliography :*
 Food Chemistry, Dimitrios Boskou, Publisher: GARTAGANIS AGIS-SAVVAS
 - *Relevant scientific journals (indicative):*
- Food Chemistry, Elsevier.
 - Journal of American Oil Chemists' Society, Springer.

- European Food Research and Technology, Springer.
- Journal of Food Composition and Analysis, Elsevier.
- Food Analytical Methods, Springer.
- International Journal of Food Science and Technology, Blackwell Publishing.
- Food and Bioprocess Technology, Springer.
- Journal of Separation Science, Wiley.
- European Journal of Lipid Science and Technology, Wiley.
- Analytica Chimica Acta, Elsevier.
- Analytical Methods, RSC Publishing - Royal Society of Chemistry.