

## Course Outline: "3101 - Food Chemistry And Analysis"

### 1. General information

<b>FACULTY/SCHOOL</b>	Physical Education, Sport Science & Nutrition		
<b>DEPARTMENT</b>	Nutrition & Dietetics		
<b>LEVEL OF STUDY</b>	Undergraduate		
<b>COURSE UNIT CODE</b>	<b>3101</b>	<b>SEMESTER</b>	<b>3<sup>rd</sup></b>
<b>COURSE TITLE</b>	<b>Food Chemistry And Analysis</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b> in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
Lectures		2	
Laboratory Exercises		2	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4</i>		<b>4</b>	<b>5</b>
<b>COURSE TYPE</b> <i>Background knowledge, Scientific expertise, General Knowledge, Skills Development</i>	Scientific expertise		
<b>PREREQUISITE COURSES</b>	No		
<b>LANGUAGE OF INSTRUCTION</b>	GREEK		
<b>LANGUAGE OF EXAMINATION/ASSESSMENT</b>	GREEK		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	YES (in English)		
<b>COURSE WEBSITE (URL)</b>			

### 2. LEARNING OUTCOMES

<p><b>Learning Outcomes</b>  <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult: Συμβουλευτείτε το</i>  <b>APPENDIX A</b></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.</i></li> <li>• <i>Descriptive indicators for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and</i></li> </ul> <p><b>APPENDIX B</b></p> <ul style="list-style-type: none"> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>The course aims to enable students to:</p> <ul style="list-style-type: none"> <li>• Understand the chemical reactions that take place during the processing, storage and cooking of food.</li> <li>• Choose means and / or conditions to avoid unwanted or development of desired changes occurring in food.</li> <li>• Apply appropriate food analysis methods to verify their identity (fraud) or quality.</li> <li>• The chemical composition of food</li> <li>• The legislative limits</li> <li>• Food labeling requirements</li> <li>• The choice of analytical methods of determination</li> </ul>

- The processing of results

Upon successful completion of the course students will be able to:

1. Students to acquire the necessary knowledge to apply the analysis.
2. To know the principles and the application of the methods of determination of the main ingredients of the food.
3. To know the composition of food and their particularities during the application of analytical techniques.

### General Competences

*Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?*

*Search for, analysis and synthesis of data and information by the use of appropriate technologies, Adapting to new situations Decision-making Individual/Independent work Group/Team work Working in an international environment Working in an interdisciplinary environment Introduction of innovative research*

*Project planning and management Respect for diversity and multiculturalism Environmental awareness Social, professional and ethical responsibility and sensitivity to gender issues Critical thinking Development of free, creative and inductive thinking ..... (Other.....citizenship, spiritual freedom, social awareness, altruism etc.) .....*

- Individual/Independent work
- Group/Team work

### 3. COURSE CONTENT

- Chemical Structure and physicochemical properties of carbohydrates, their detection and discrimination, caramelization, food tarnishing reactions, important carbohydrate food.
  - Structure and chemical properties of lipids, stable fats, receipt and analysis of lipids from plant and animal tissues, their role in nutrition
  - Structure of amino acids, peptides, proteins, functional and chemical properties of proteins, Maillard reaction (individual reactions, control and inhibition), role of proteins in human nutrition.
  - Vitamins. Chemical structure, nomenclature and sources, effect of processing.
  - Food additives. Food micronutrients. New food and food substitutes.
  - Chemical changes that occur during processing, storage and cooking of food.
  - Unwanted food substances, dioxins, enzymatic tarnish, enzyme tarnish control.
  - Odor-taste, types of taste, aftertaste, taste modification, odor and chemical structure, determination of odor taste.
1. Sampling and preparation of laboratory samples for analysis. Macroscopic examination. Natural food constants.
  2. Statistical processing and presentation of results of analytical methods.
  3. Principles of analytical methods of determination:
    - humidity,
    - protein,
    - carbohydrates,
    - fats - fatty acids,
    - vitamins,

- enzymes,
  - sulfur dioxide,
  - Salt
  - Ash
  - inorganic components of food,
  - natural antioxidants and additives in different foods.
- Applications of the above analysis methods in basic food categories.
4. Isolation and analysis of aromatic components of food.
  5. Modern methods of detecting adulteration in food.
  6. Monitoring of analytical methods as proposed by existing Community legislation.

#### 4. TEACHING METHODS - ASSESSMENT

<p><b>MODES OF DELIVERY</b> <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc..</i></p>	In class lecturing	
<p><b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b> <i>Use of ICT in teaching, Laboratory Education, Communication with students</i></p>	E class	
<p><b>COURSE DESIGN</b> <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc. The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</i></p>	<b>Activity/Method</b>	<b>Semester workload</b>
	Lectures	50
	Laboratory Classes	50
	Personal Study	25
<p><b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b> <i>Detailed description of the evaluation procedures:</i></p> <p><i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i></p> <p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i></p>	<p>Written final exam (100%) which includes:</p> <ul style="list-style-type: none"> <li>➤ Multiple choice questions</li> <li>➤ short- answer questions,</li> <li>➤ open-ended questions,</li> <li>➤ problem solving,</li> <li>➤ written work, essay/report,</li> <li>➤ laboratory work,</li> </ul>	
	<b>Total</b>	<b>125</b>

#### 5. SUGGESTED BIBLIOGRAPHY

*-Suggested bibliography:*

1. ΧΗΜΕΙΑ ΤΡΟΦΙΜΩΝ, Σφλώμος Κωνσταντίνος, Έκδοση: 2η/2019, ISBN: 978-618-5309-66-4, Εκδότης: ΤΣΟΤΡΑΣ ΑΝ ΑΘΑΝΑΣΙΟΣ
2. Λειτουργικές Ιδιότητες Νερού, Πρωτεϊνών, Σακχάρων, Λιπιδίων και Φυσικών Χρωστικών, Κυρανάς Ευστράτιος 1η Έκδοση/2011, ISBN: 978-960-418-369-2, Εκδότης: ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε.
3. Χημεία Τροφίμων, Μπόσκου Δημήτριος, Έκδοση: 5/2004, ISBN: 960-7013-22-0, Εκδότης: ΓΑΡΤΑΓΑΝΗΣ ΑΓΙΣ-ΣΑΒΒΑΣ
4. Ανάλυση Τροφίμων (Β' Έκδοση), Ανδρικόπουλος Νικόλαος
5. Εργαστηριακές αναλύσεις και ποιοτικός έλεγχος στις βιομηχανίες τροφίμων, Καραουλάνης Γεώργιος Δ.
6. Ενόργανη Ανάλυση, Granger II M. Robert, Yochum M. Hank, Granger N. Jill, Sienerth D. Karl
7. Εργαστηριακές μέθοδοι ποσοτικής χημικής ανάλυσης, Στράτης Ιωάννης Α., Ζαχαριάδης Γεώργιος Α., Βουλγαρόπουλος Α. Ν.

*-Συναφή επιστημονικά περιοδικά:*

- Food Chemistry
- Food Research International
- Food Analytical Methods
- Food and Bioproducts Processing
- Food Quality and Preference