

Course Title	<b>Food Chemistry and Nutritional Analysis</b>				
Course Code	PHA209				
Course Type	Compulsory				
Level	BSc (Level 1)/ MPharm (Level 2)				
Year / Semester	2 <sup>nd</sup> / 4 <sup>th</sup> Semester				
Teacher's Name	Dr Despina Charalambous, Dr Stalo Papoutsou				
ECTS	6	Lectures / week	2+1*	Laboratories/week	2
Course Purpose	<p>The aim of this course is to introduce students to food chemistry and nutrition. This will be fulfilled through the completion of the following: satisfactory knowledge of the ingredients, properties and nutritional values of food as well as the changes occurring during food preservation. This course also aims to introduce students to food processing and changes in food ingredients during processing. Another aim is to provide students with information on food additives. Furthermore, students become familiar with nutritional values as well as to special types of food and diets. They are introduced to food biotechnology, problems arising from it and the new nutritional habits are also included. Food chemistry and nutrition is necessary for understanding the important issue of drug-food interactions. Relationships between food, health and disease are also examined.</p> <p>*tutorial</p>				
Learning Outcomes	<p>By the end of this course, the students should be able to:</p> <ul style="list-style-type: none"> <li>Identify the exact constitution of all common food material, the properties and nutritional value of every common food;</li> <li>Explain the food processes in food industry, storage, preservation, as well as in the organism;</li> <li>Explain food processing at home and in industry as well as the changes to food constituents during processing;</li> <li>State how food is processed in the body;</li> <li>Distinguish the various types of special food and diets;</li> <li>Distinguish the chemical, biological and toxicological properties of the common food additives;</li> <li>Analyse the consequences of food processing, preservation, new nutritional habits and be introduced to the biotechnology of nutritional products.</li> <li>Analyse and determine many of the food constituents; State how food can modify the biological action of several drugs</li> </ul>				
Prerequisites	PHA101	Corequisites	None		

<p>Course Content</p>	<p>Theory:</p> <p>Detailed chemical introduction for food and other nutrients for pharmaceutical scientists. Origin and sources of food. Natural ingredients of food.</p> <p>Food structural characteristics, physicochemical, functional properties. Influence of external factors, processing and other parameters. Foods of animal and vegetable origin: meat, fish, milk and milk products, cereals and legumes, oils and their products, fruits and seeds.</p> <p>Role of water and sodium chloride in food and food preparation. Drinking water.</p> <p>Vitamins, minerals, spices and flavorings.</p> <p>Food sampling and analysis. Natural undesirable food ingredients.</p> <p>Biochemical changes of the main ingredients of food during ripening and cooking. Biochemical changes during food spoilage. Food microbiology data.</p> <p>Food production in industry, processing, maintenance. Food additives, for color, aroma, taste and texture enhancement, antioxidants and other preservatives.</p> <p>Introduction to nutrition, digestion, digestion of food ingredients (proteins, carbohydrates, lipids, vitamins, digestive fibers, minerals). Dietary foods, fortified foods, special diets. Functional Food, Probiotic Foods, Pharmacovigilance and Genetically Modified Foods. Problems with food processing, food preservation, new eating habits.</p> <p>Worldwide food trade, nutrition differences and nutrition education. Food and nutrition of the future. Relation of food science to pharmaceutical sciences.</p> <p>The diseases of modern societies and the role of food and nutrition. Diseases caused by food deficiency and excess. Food as a harmful material or as a medicine.</p> <p>Worldwide food trade, nutrition differences and nutrition education. Food and nutrition of the future. Relation of food science to pharmaceutical sciences.</p> <p><b>Laboratory experiments/exercises:</b></p> <p>As part of the course, laboratory exercises are carried out on the course material for a better deepening and consolidation of the theoretical part. Indicative exercises are: determination of water-moisture in food,</p>
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	determination of the acidity of orange juice, determination of formaldehyde in orange juice, determination of sodium chloride in cheese and milk, check for honey impurities, determination of sugars and fermented carbohydrates, non-enzymatic reactions, characterization of quality characteristics of olive oils.
Teaching Methodology	<p>Teaching methodology includes lectures on the theoretical background and laboratory exercises / experiments to better understand concepts of Food Chemistry and nutritional analysis. Detailed lecture notes are presented with image-rich material and short animations to help understand several biological processes. During the lecture, a discussion is carried out so as students are encouraged to answer questions and draw their own conclusions.</p> <p>As part of the developing students' skills, laboratory exercises are carried out by the students themselves in the Laboratory of Chemistry with the proper laboratory equipment and under the supervision of teaching personnel. Appropriate preparation and demonstration by the laboratory personnel precedes each laboratory exercise. Assessment of laboratory exercises is performed by submitting laboratory reports by each student.</p>
Bibliography	<p>(a) <u>Textbooks</u>:</p> <ol style="list-style-type: none"> <li>1. «Διατροφή και Χημεία Τροφίμων στη Δημόσια Υγεία», Κ. Κοτροκόης, 2<sup>η</sup> έκδοση, 2017, Ιατρικές εκδόσεις Βασιλειάδης.</li> <li>2. «Food Chemistry», H.D. Belitz, W. Grosch, P. Schieberle, Μετάφραση στα Ελληνικά: Μ. Παπαγεωργίου, Α.Ι. Βάρναλη, Επιστ. Επιμέλεια Σ.Ν. Ραφαηλίδης, Εκδόσεις Τζιόλα, 2012, Θεσσαλονίκη</li> </ol> <p>(b) <u>References</u>:</p> <ol style="list-style-type: none"> <li>1. «Textbook of Lifestyle Medicine», Labros S. Sidossis, Stefanos N. Kales, εκδόσεις Wiley, 2022.</li> <li>2. “CRC Handbook of Nutrition and Food”, C.D. Berdaniev, Editorial Board C.D. Bertaniev et al., CRC Press, 2013, Boca Raton, FL.</li> <li>3.«Χημεία Τροφίμων», Δ. Μπόσκου, Εκδόσεις Γαρταγάνη 2010, Θεσσαλονίκη.</li> </ol>
Assessment	<p>For student evaluation, the overall grade is determined by a written midterm exam (20%), a laboratory grade (20%) and a written final exam (60%).</p> <p>The mid-term exam is carried out between the 6th and 8th week and it mainly includes short answer questions and problem- solving questions and examines specific modules of the course.</p> <p>As far as the laboratory grade is concerned, it comprises of the evaluation of the laboratory reports (60% of the laboratory grade) provided by the students for every experiment and a final laboratory examination (40% of the laboratory grade) which mainly includes short answer questions and problem-solving questions. In the laboratory reports, students are asked to describe the experiment procedure, to evaluate and analyse their results and to answer specific questions. The following criteria are taken into account when evaluating laboratory reports: (a) experimental data collection (30%), (b) data analysis (40%), and application of theory to draw conclusions (30%).</p> <p>The final exam of the course is carried out during the 14th-16th week of each semester and includes short answer questions, decision questions,</p>



	<p>and problem-solving questions regarding all course modules.</p> <p>The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.</p>
Language	Greek, English