**OUTLINE: Health Natural Products**

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| Course Title | Health Natural Products | | | | |
| Course Code | DLPHA 702 | | | | |
| Course Category | Compulsory | | | | |
| Level | Postgraduate/Master | | | | |
| Year / Semester | 1st year, 1st semester | | | | |
| Name of Teacher | Dr. G. A. Karikas, Dr. D. Charambous | | | | |
| ECTS | 10 | Lectures / Week | | Εργαστήριο / Βδομάδα | - |
| Aim and objectives of the course | The course aims to educate students in the subject of Chemistry, Biochemistry and Biological activity of natural products, from plant and other organisms, which constitute the raw materials for the manufacture of cosmetics and dietary supplements. Basic knowledge of the origin, biosynthesis and biological activity of natural compounds, per chemical category and plant organism, will be taught. Their mechanisms of action will be described at the molecular level, with particular emphasis on the antioxidant, anti-inflammatory, antimicrobial, etc. actions of natural biomolecules, which are contained as active ingredients, in cosmetics, dietary supplements and other health products.<br>Finally, emphasis will be placed on the utilization of Greek and Cypriot flora and on modified products for the improvement and treatment of skin problems, related to free radicals, oxidative stress, ultraviolet radiation, nutrition, etc. | | | | |
| Learning outcomes | Upon completion of the course, students will be able to:<br>• Define the chemistry and biological value of essential oils, phenolic compounds, vitamins, minerals/trace elements, peptides, lipids, essential amino acids and omega-3 fatty acids, key components of cosmetics/natural health products.<br>• Recognize the importance of biodiversity, bioactive molecules and plants used in natural products. | | | | |

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| | • Evaluate the potential interactions of plant extracts with prescription drugs.<br>• Explain the antioxidant, anti-inflammatory, antimicrobial and cosmetic effects of natural products on the skin and the body in general.<br>• Define the methods of obtaining, isolating and chemical characterization of compounds used for the production of cosmetics and dietary supplements.<br>• Evaluate the potential of new formulations. | | |
| Pro-required | - | Co-required | - |
| Course content | Brief historical review of the use of natural products (NPs) in therapeutics and cosmetology<br>• Role of primary/secondary metabolites in plants<br>• Biochemical pathways of NP biosynthesis<br>• Chemical categories of PP: peptides, lipids, essential amino acids and fatty acids<br>• Terpenes, phenolic compounds and flavonoids<br>• Vitamins, electrolytes and trace elements used in health products<br>• Biological actions/mechanisms of PP actions in humans<br>• Mechanisms of oxidative stress development in the body and skin,<br>• Endogenous and exogenous antioxidants<br>• Medicinal/aromatic plants-potential interactions of plant extracts with prescribed drugs<br>• Physicochemical methods for isolation/identification and biological evaluation of PPs<br>• Nutricosmetics. | | |
| Teaching methods | The theoretical part of the course is offered through lectures and discussions. The discussion with the students includes questions/answers, disadvantages/advantages, role play and case studies. In addition, recent research findings and review studies are included. The teaching uses detailed notes with PowerPoint and other interactive educational tools. | | |
| Bibliography | **Bibliography in Greek**:<br>Natural Product Chemistry, Stephen P. Stanforth, Parisian | | |

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| | Publications, 2010<br><br>Medicinal Products of Natural Origin, Gunnar Samuelsson, University Publications of Crete, 2010<br><br>**Bibliography in English:**<br><br>Antioxidants. Edited by Emad Shalaby, 2019<br><br>Hardback Progress in the Chemistry of Organic Natural Products, Edited by A. Douglas Kinghorn, Springer Nature Switzerland AG, 2019<br><br>Pharmacognosy, GE Trease and WC Evans, Bailliere Tindall, 2010<br><br>Medicinal natural products: a biosynthetic approach, P.M. Dewick, Published by Wiley, 2008 |
| Evaluation | • Weekly Educational Activities (15 %)<br>• Assignment 1 (20 %)<br>• Assignment 2 (15 %)<br><br>Assignments 1, 2 concern the development of a small-scale research project. Students are expected to design and implement a small-scale research project (including a literature review, methodology, presentation of results and discussion) and present their research to their fellow students as part of the course and assessment.<br><br>• Final Examination (50 %).<br><br>The final examination is a written examination and is scheduled during the examination period at the end of the semester. The examination material is determined by the instructor and communicated to the students in good time. |
| Language | Greek |