

COURSE OUTLINE

(1) GENERAL

SCHOOL	of HEALTH and CARE SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
DIVISION	AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	4041	SEMESTER	4
COURSE TITLE	CHEMISTRY & COSMETIC SCIENCE OF NATURAL PRODUCTS		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Theory		3	4
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specific Background Courses (SBC)		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/main/portfolio.php https://eclass.uniwa.gr/courses/AISTH140/		

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course for students is to understand the basic principles of chemistry and cosmetic science of natural products such as: plant species, essential oils, extracts, minerals, probiotics and marine ingredients, which have an effective action on skin care products.

The goal of the course is to teach students the basic principles of chemistry of plant ingredients (phytochemistry), how to isolate, process them, such as methods of distillation, production and utilization on a laboratory and industrial scale. The categories of natural ingredients used as raw materials and active ingredients in the production of cosmetic products and their dermo-cosmetic and therapeutic properties will be taught.

Learning outcomes

After the end of the course students will be able to know:

- The types of plants, marine and mineral ingredients used in cosmetic science.
- The basic chemical structure of the active substances which constitute the natural ingredients and where their action is due.
- The properties of natural and herbal ingredients and their cosmetic and pharmaceutical-therapeutic use and application.
- The methods of isolation, preparation (distillation, extraction, etc.) and their final processing.
- The way of their exploitation and the methods of use of plants, essential oils and other natural products in the industrial production of cosmetics, medical devices and pharmaceutical products.
- The method of evaluation and the techniques of physicochemical control of the quality of natural active substances.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

Others...

Working independently, team work, working in an interdisciplinary environment, working in an international environment, Search for, analysis and synthesis of data and information, with the use of the necessary technology, Production of new research ideas, Production of free, creative and inductive thinking

(3) SYLLABUS

1. *Chemical classification and biosynthesis of substances contained in drugs and other natural ingredients (hydrocarbons, lipids, phenols and derivatives, tannins, flavonoids, terpenoids, steroids, alkaloids).*
2. *Types of herbal remedies and their properties in cosmetic science.*
3. *Types of marine and mineral ingredients, used in cosmetic science.*
4. *Manufacturing process of aromatic and pharmaceutical plants.
Cultivation- Harvesting- Drying - Cutting - Sorting.*
5. *Plant extracts. Maceration – Extraction - Decoctions - Infusion - Tinctures - Pillular (semisolid) extracts - Powdered extracts.*
6. *Hot continuous extraction (Soxhlet) - Aqueous-alcoholic extraction by fermentation- Microwave-assisted extraction.*
7. *Supercritical fluid extraction- - Ultrasound extraction (sonication).
Extraction by distillation - Extraction by pressure. Industrial extractions.*
8. *Production of essential oils. Distillation with water - distillation with water & water vapor - distillation with water vapor. Industrial manufacturing of essential oils. Formation of a distillation unit. Distiller-Refrigerator-Separator.*
9. *"Concretes" - "Absolutes" - Pomates - Retinoids - Oil resins. Properties and differences. Isolation and production methods. Advantages and uses in cosmetology and pharmacy.*
10. *Chemical analysis and evaluation of the quality of plants and essential oils. Quality assessment techniques.*
11. *Methods of isolation, biotechnological process, efficiency improvement and production in industrial scale.*
12. *Efficacy, safety test and use in cosmetics and pharmaceutical industry.*
13. *Nutraceuticals, Dietary supplements and Herbal medicines.*
14. *Properties and uses of aromatic and medicinal plants and essential oils in production of dermocosmetics, medical devices products and pharmaceutical products.*

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT in teaching, Support of the learning process through e-class for the theoretical and laboratory part, videos of lectures of the course under the auspices of the Institution, Exercises through e-class.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lecture	80
	Educational visit	10
	Independent study	30
	Course total	120
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	FINAL WRITTEN EXAMINATION (100%): Multiple choice questionnaires, open-ended questions, characterization of sentences as true or false, problem solving, complete of answers.	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography :

1. Τσιρίβας Ε., Βαρβαρέσου Α. Παπαγεωργίου Σ. Βασικές Αρχές Κοσμητολογίας ISBN: 978-960-394-920-6 ΕΠΙΣΤΗΜΟΝΙΚΕΣ ΕΚΔΟΣΕΙΣ ΠΑΡΙΣΙΑΝΟΥ ΑΕ, 2012.
2. Σκρουμπής Β. (1985) Αρωματικά Φυτά και Αιθέρια έλαια.
3. Χαντζοπούλου Π., Κατσιώτης Σ. (2013) Αρωματικά Φαρμακευτικά Φυτά και Αιθέρια Έλαια.
4. Sakamoto K., Lochhead R., Maibach H. and Yamashita Y. Cosmetic Science and Technology: Theoretical Principles and Applications, eBook ISBN: 9780128020548 Hardcover ISBN: 9780128020050, Elsevier (2017).
5. Hibbot H.W. Handbook of Cosmetic Science: An Introduction to Principles and Applications 1483186474, 9781483186474, Elsevier (2016).
6. Review of Herbal Principles in Cosmetics: Properties and Mechanism of Action, Cindy K. Angerhofer, Aveda Corporation, Minneapolis, Minnesota Journal of Natural Products, 2011, 74 (4), pp 911–911
7. Barnes J, Anderson L., Phillipson D. (2002) Herbal Medicines. Pharmaceutical Press, London

8. Croteau R. (1992) Biochemistry of Monoterpenes and Sesquiterpenes of the Essential Oils. In Herbs, Spices and Medicinal Plants. Vol. 1. L. Cracer and J. Simon Editors, Food Products Press, NY
9. Biotechnology of Natural Products. Schwab, Wilfried, Lange, Bernd Markus, Wüst, Matthias
10. Methods in Biotechnology. Natural Products Isolation, Second Edition Edited by Satyajit D. Sarker, Zahid Latif, and Alexander I. Gray. Humana Press, Totowa, NJ. 2005
11. Herbal Principles in Cosmetics. Properties and Mechanisms of Action. Editor: Dr. Roland Hardman, by Taylor and Francis Group, LLC, 2010

- Related academic journals:

International Journal of Cosmetic Sciences

Cosmetics

Pharmaceutics

Antioxidants

Ecotoxicology

Sustainability