COURSEOUTLINE

1.GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	6051	**SEMESTER**	6
COURSE TITLE	BIOTECHNOLOGY IN COSMETIC SCIENCE		

INDEPENDENTTEACHINGACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises,etc.Ifthecreditsareawardedforthewholeofthe course,givethe weeklyteachinghoursandthetotalcredits*	WEEKLYT EACHING HOURS	CREDITS
Lectures	3	
Laboratory exercises	-	
		5
Addrowsifnecessary.Theorganisationofteachingandtheteaching methodsusedaredescribedindetailat (d).		

COURSETYPE *general background,specialbackground,specialisedgeneral knowledge,skillsdevelopment*	OCSBC
PREREQUISITECOURSES:	No
LANGUAGEOFINSTRUCTIONand EXAMINATIONS:	Greek
ISTHECOURSEOFFEREDTO ERASMUSSTUDENTS	Yes
COURSEWEBSITE(URL)	https://bisc.uniwa.gr/course/viotechnologia-stin-kosmitologia/ https://eclass.uniwa.gr/courses/AISTH162/

2. LEARNINGOUTCOMES

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 is to acquaint students with the applications of Biotechnology in Cosmetology and dermatological products and also the processes of production and recovery of biotechnological products.
The objective of the course is the information of the development and application of advanced technologies and the exploitation of renewable sources for the acquisition and study of bioactive compounds and raw materials that are necessary for various product categories in the modern cosmetics industry.

Learning outcomes

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

- Know the basic principles of Biotechnology,
- Learn the substrates of biotechnology and renewable sources for the production of cosmetic ingredients

- Understand the production and recovery processes of raw materials and bioactive ingredients used in cosmetology and dermal products.
- Identify the advantages and possible disadvantages of obtaining bioactive substances and raw materials by biotechnological methods.

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, Teamwork, Working in an interdisciplinary environment, Working in an international environment, Production of free, creative and inductive thinking, Production of new research ideas, Development of environmental consciousness	

3. SYLLABUS

1. Introduction to Biotechnology.
2. Biotechnology of microorganisms (methods of controlling the growth of microorganisms - bioreactors and culture systems).
3. Biotechnology Substrates (nutrient substrates for the growth of cell cultures, biomass, substrates as carbon sources, nitrogen sources, chemical-petrochemical as substrates, products in Biotechnology).
4. Industrial fermentations, kinetic parameters of the growth of microorganisms, fermenters, sterilization, fermentation process, recovery of biotechnological products.
5. Plant cell cultures, enzyme reactions, biocatalytic processes and other advanced technologies for the development of (new) active compounds and raw materials.
6. Algae cultures.
7. Stem cell technology in cosmetic products.
8. Contribution of biotechnology to the improvement of the processes of preparation of cosmetic products and development of innovative cosmetic products.

9. Applications of biotechnology in cosmetology (amino acids, peptides, proteins, enzymes, vitamins).
10. Applications of biotechnology in cosmetology (alcohols, glycosides, phenolic acids, secondary metabolites, etc.).
11. Development and evaluation of systems for providing safety / stability of modern biotechnological cosmetic products
12. Regulatory requirements in the field of biotechnological cosmetics raw materials with emphasis on their quality and safety.
13. Biotechnology and bioethics, effects of biotechnology.

4. TEACHINGandLEARNINGMETHODS-EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to- face
USEOFINFORMATIONANDCOMMUNICATIONSTECHNOLOGY *Use of ICT in teaching, laboratory education, Communication with students*	Use of ICT in teaching, Support of learning process through e-class Exercises through e-class, communication with students
TEACHINGMETHODS *The manner and methods of teaching are described in detail.* *Lectures,seminars,laboratorypractice,fieldwork,studyandanalysisofbibliography,tutorials,placements,clinicalpractice,artworkshop,interactiveteaching,educationalvisits, 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*	***Activity*** — ***Semesterworkload*** Lectures — 90 Independent study — 30 Course total — *120*
STUDENTPERFORMANCEEVALUATION *Descriptionoftheevaluationprocedure* *Language of evaluation, methods of evaluation,summativeorconclusive,multiplechoicequestionnaires,short-answerquestions,open-ended questions, problem solving, written work,essay/report,oralexamination,publicpresentation,laboratorywork,clinicalexaminationofpatient,artinterpretation,other* *Specifically-defined evaluation criteria aregiven, and if and where they are accessible to students.*	Greek language, Final written examination (100%): Multiple choice questionnaires, short-answer questions, true or false questions Criteria are given

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Kyriakidis D., Biotechnology ISBN: 9604315951, ZHTH, Thessaloniki, (2000).
2. Lad R., Biotechnology in Personal Care, ISBN-13: 9780824725341, Taylor and Francis Group, New York, (2006).
1. Khan, F. A., *Biotechnology in Medical Sciences,* ISBN-13: 9781482223675, Taylor and Francis Group, New York, (2014).
2. Doelle H. H., Roken S. and Berovic M., *Biotechnology Fundamentals in Biotechnology Volume XIV,* ISBN: 9781848262683, EOLSS Publishers/ UNESCO, Oxford, United Kingdom (2009).
3. Marian P., *Advances in Applied Biotechnology*, ISBN: 9789533078205, In Tech, Croatia, (2012).
4. Sambamurthy K. and Kar A., *Pharmaceutical Biotechnology*, ISBN: 9788122424249 New Age International, New Delhi (2016).
5. Farris P.K., *Cosmeceuticals and Cosmetic Practice*, ISBN: 978-1-118-38482-4, John Wiley & Sons, Ltd, UK, (2014).

- Related academic journals: International Journal of Cosmetic Science, Journal of Cosmetic Science, Antioxidants, Molecular Biology Reports, Applied Microbiology, Plants, Cosmetics