Study Guide

Master of Science

Advanced Aesthetics and Cosmetic Science: Development-Quality Control and Safety of new cosmetic products

DEPARTMENT OF BIOMEDICAL SCIENCES

UNIVERSITY OF WEST ATTICA

Egaleo, 2023

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1. Introduction

The master's degree being established specializes in the following scientific files:

a) the treatment of aesthetic problems with innovative cosmetic products and the use of modern devices of biomedical technology.

b) the treatment of facial and body aesthetic problems by the Aesthetician, to the extent permitted by the current legislation, with innovative cosmetic products and the use of modern devices of biomedical technology

c) The extensive study of the mechanisms of action of the bioactive ingredients incorporated in cosmetic products

d) The research and development (formulation) of various cosmetic products of different technical forms and solving of problems that occur during design, development and manufacturing in cosmetic science.

e) The quality control and quality assurance of both development and manufacturing of cosmetic products.

f) The efficacy studies of cosmetic products which have to be performed according to European Regulation for Cosmetics (EC) 1223/2009 and Commission Regulation (EU) No 655/2013 in order to support and ensure the legal compliance, truthfulness, evidential action, honesty and fairness.

g) The safety assessment of cosmetic products, regarding the toxicological profile of raw materials, packaging materials and finished products to consumers. Furthermore, the clinical studies performed for both safety assessment and efficiency of product are taught and specialized.

2. Structure of Postgraduate course curriculum

The duration of the post graduate program which leads to the Graduate Diploma is defined in three (3) academic semesters, which also include the time for preparing a diploma thesis.

M/O* (mandatory / optional)

	COURSE TITLE	M/O*	ECTS	STUDENT EFFORT HOURS
MANDATORY MODULES 1st Semester				
1	Advanced Dermatoaesthetics I	M	8	240
2	Innovative Active Ingredients in Cosmetics and Personal Care Products	M	7	210
3	Advances in Dermatology	M	7	210

4	Formulation of Cosmetics and Personal Care Products I	M	8	240
	TOTAL		**30**	**900**
MANDATORY MODULES 2nd Semester				
1	Advanced Dermatoaesthetics II	M	6	180
2	Biomedical Technology Applications in Dermatoaesthetics	M	7	210
3	Quality control in Cosmetic Science	M	8	240
4	Formulation of Cosmetics and Personal Care Products II	M	9	270
	TOTAL		**30**	**900**
MANDATORY MODULES 3rd Semester				
1	Efficacy and Safety of cosmetic products	M	10	300
2	Thesis	M	20	600
3	Seminars	O		
	TOTAL		**30**	**900**

3.Course Curriculum

To complete the program, students are required to attend nine (9) courses, a number of seminars and write and successfully support a postgraduate thesis.
The courses are distributed: four (4) in the 1st semester of studies, four (4) in the 2nd semester, while in the 3rd semester of studies, there is one (1) course, the seminars and the preparation of the diploma thesis. Ninety (90) Credit Units (ECTS) are required to obtain the Master's Degree, which are divided into thirty (30) over the three semesters of study. The postgraduate thesis corresponds to twenty (20) ECTS.

3. Study Program of the Division of Aesthetics & Cosmetic Science

Department of Biomedical Sciences common semesters (1st, 2nd and 3rd) course curriculum

Table3.1 – 1st Semester study guide

Course code	Order No	1st Semester	Theoretical courses (hours/week)	Laboratory courses (hours/week)	Total hours per week	Course working load	ECTS credits	Course type
1011-1012	**1**	ANATOMY I	3	2	5	180	7	GBC /C
1021-1022	**2**	GENERAL & INORGANIC CHEMISTRY	3	2	5	180	7	GBC /C
1031	**3**	CELL BIOLOGY	3	0	3	110	4	GBC /C
1041-1042	**4**	BIOPHYSICS	3	2	5	180	7	GBC /C
1051	**5**	BIO INFORMATICS	3	0	3	90	3	GBC /C
1061	**6**	MATHEMATICS IN BIOMEDICAL SCIENCES[1]	2	0	2	60	2	GBC /C
		TOTAL	**17**	**6**	**23**	**800**	**30**	

Table3.2 – 2nd Semester study guide

Course code	Order No	2nd Semester	Theoretical courses (hours/week)	Laboratory courses (hours/week)	Total hours per week	Course working load	ECTS credits	Course type
2011	**1**	ANATOMY II	4	0	4	160	6	GBC /C
2021	**2**	BIOCHEMISTRY	3	0	3	90	3	GBC /C
2031	**3**	ORGANIC CHEMISTRY	3	0	3	90	3	GBC /C
2041	**4**	INTRODUCTION TO BIOMEDICAL SCIENCES	2	0	2	60	2	GBC /C
2051-2052	**5**	PHYSIOLOGY	4	2	6	210	8	GBC /C
2061-2062	**6**	BIOSTATISTICS	2	2	4	160	6	GBC /C
2071	**7**	BIOMEDICAL ENGLISH TERMINOLOGY[2]	2	0	2	60	2	GBC /C
		TOTAL	**20**	**4**	**24**	**830**	**30**	

1 The 1st Semester's common course "BIOMEDICAL ENGLISH TERMINOLOGY- Course code 1061" is moved in the 2nd Semester with course code 2071 retaining the same hours/week and ECTS credits and replaced by the new course "MATHEMATICS IN BIOMEDICAL SCIENCES" with course code 1061 and same hours/week and ECTS credits.

2 In the 2nd Semester there is a reduction of hours/week and ECTS credits (from 4 to 2) for the common course: "INTRODUCTION TO BIOMEDICAL SCIENCES- Course code 2041" (Assembly 12/10.09.19).

Chart 3.3 – 3rd Semester study guide

Course code	Order No	3rd Semester	Theoretical courses (hours/week)	Laboratory courses (hours/week)	Total hours per week	Course working load	ECTS credits	Course type
3011	**1**	PHARMACOLOGY	3	0	3	90	3	GBC /C
3021	**2**	RESEARCH METHODOLOGY	4	0	4	120	4	GBC /C
3031-3032	**3**	FIRST AID	2	2	4	120	4	GBC /C
3041	**4**	GENERAL MICROBIOLOGY	4	0	4	120	4	GBC /C
3051	**5a**	PHYSIOLOGY OF THE STOMATOGNATHIC SYSTEM	3	0	3	**90**	**3**	SBC/CE
3052	**5b**	ANATOMY OF THE EYE						
3053	**5c**	NOSOLOGY*						
3061	**6a**	HISTOLOGY OF ORAL CAVITY AND DENTAL TISSUES	4	0	4	**140**	5	SBC/CE
3062	**6b**	OPTICAL MATERIALS OF OPHTHALMIC LENSES AND HISTORY OF GLASS						
3063	**6c**	BASIC PRINCIPLES OF DERMATO-COSMETIC SCIENCE						
3064	**6d**	PATHOPHYSIOLOGY						
3065	**6e**	INTRODUCTION TO RADIATIONS						
3071-3072	**7a**	INTRODUCTION TO BIOMATERIALS OF DENTAL TECHNOLOGY	4	2	6	180	7	SBC/CE
3073-3074	**7b**	GEOMETRICAL AND PHYSICAL OPTICS						
3075-3076	**7c**	BASIC PRINCIPLES OF DERMATOLOGY						
3077-3078	**7d**	PRINCIPLES OF INSTRUMENTAL ANALYSIS						
3079-3080	**7e**	INTRODUCTION TO MEDICAL IMAGING AND RADIOTHERAPY						
		TOTAL	**24**	**4**	**28**	**860**	**30**	

* Shared optional course for the Divisions of: Aesthetics & Cosmetic Science, Radiology & Radiotherapy, Medical Laboratories Science

ABBREVIATIONS

General Background Course: ***GBC*** *Specific Background Course:* ***SBC*** *Specialization Course:* ***SC*** *Compulsory Elective:* ***CE*** *Compulsory* ***(C)***

Table 4.1 –Weekly Timetable -4th Semester

Subject Code	s/n	4th Semester	Theoretical	Lab	Total	Total Workload	(ECTS)	Subject Category
4011	**1**	Nutrition and Skin	3	0	3	90	4	SBC
4021-4022	**2**	Spa Therapy- Thermalisation	3	2	5	174	7	SBC
4031	**3**	Dermato-Aesthetics I	3	0	3	120	4	SBC
4041	**4**	Chemistry & Cosmetic Science of Natural Products	3	0	3	120	4	SBC
4051	**5**	Dermatology I	3	0	3	90	4	SBC
4061-4062	**6**	Dermato-Cosmetic Science I	3	3	6	174	7	SC
		Total	**18**	**5**	**23**	**828**	**30**	

Table 4.2 - Weekly Timetable -5th Semester

Subject Code	s/n	5th Semester	Theoretical	Lab	Total	Total Workload	(ECTS)	Subject Category
5011-5012	**1**	Dermato-Aesthetics II	3	3	6	210	7	SC
5021-5022	**2**	Dermatology II – Venereology	3	2	5	144	5	SC
5031-5032	**3**	Dermato-Cosmetic Science II	3	3	6	210	7	SC
5041	**4**	Adverse events of cosmetic products-Toxicology	3	0	3	120	4	SBC
5051-5052	**5**	Make-up/Permanent make -up (PMU)	4	2	6	174	7	SC
		Total	**16**	**10**	**26**	**858**	**30**	

Table 4.3 - Weekly Timetable -6th Semester

Subject Code	s/n	6th Semester	Theoretical	Lab	Total	Total Workload	(ECTS)	Subject Category
6011-6012	**1**	Efficacy of Cosmetic products	3	3	6	210	7	SC
6021-6022	**2**	Electrical Dermatotherapy I	3	3	6	210	**7**	SC
6031-6032	**3**	Quality Control of Cosmetic products	3	3	6	210	7	SC
6041	**4α**	Environment and Cosmetic Products	3	0	3	120	4	SBC
6042	**4β**	Basic Principles in Aesthetic Dermatology						
6051	**5α**	Biotechnology in Cosmetic Science	3	0	3	120	5	SBC
6052	**5β**	Manufacturing of Cosmetic products						
		Total	**15**	**9**	**24**	**900**	**30**	

Table 4.4 - Weekly Timetable -7th Semester

Subject Code	s/n	7th Semester	Theoretical	Lab	Total	Total Workload	(ECTS)	Subject Category
7011-7012	**1**	Electrical Dermatotherapy II-Laser	3	3	6	210	7	SC
7021-7022	**2**	Non-invasive treatment of obesity	4	2	6	210	7	SC
7031-7032	**3**	Enzymatic Dermatotherapy	3	2	5	210	7	SC
7041	**4**	Delivery Systems of bioactive substances	3	0	3	120	5	SC
7051	**5α**	Ethics of Profession	2	0	2	90	4	SBC
7052	**5β**	Legislation of cosmetics and medical devices						
		Total	**15**	**7**	**22**	**840**	**30**	

Table 4.5 - Weekly Timetable -8th Semester

Subject Code	s/n	8th Semester	Theoretical	Lab	Total	Total Workload	(ECTS)	Subject Category
8011	**1**	Alternative Therapies	3	0	3	**90**	5	SBC
8021	**2**	Safety assessment of cosmetics	3	0	3	**90**	5	SBC
8031	**3**	Bioethics	3	0	3	**90**	5	SBC
8041	**4**	Laser Safety	3	0	3	**90**	5	SBC
8051	**5**	Aging -Longevity	3	0	3	**90**	5	SBC
8061	**6**	Hygiene and Epidemiology	3	0	3	**90**	5	SBC
8071	**7**	Dermatology and Aesthetic in Specific Population	3	0	3	**90**	5	SBC
8081	**8**	Packaging of Cosmetics	3	0	3	**90**	5	SBC
8091	**9**	Natural and Organic Cosmetics	3	0	3	**90**	5	SBC
80101-80102	**10**	Aesthetic Physical Gymnastics	2	1	3	**90**	5	SBC
80111	**11**	Aesthetic and Dermato-Cosmetic Science in oncology patients	3	0	3	**90**	5	SBC
80121-80122	**12**	Plastic Surgery and Sports Activity	2	1	3	**90**	5	SBC
80131	**13**	Skin Laser applications and Photonics	3	0	3	**90**	5	SBC
80141	**14**	Undergraduate Thesis (Dissertation)					10	SC
80151	**15**	Undergraduate Internship					10	SC
		Total					**30**	

1. Choice of Course's Type at 8th semester

	Type of Course	Nr	(ECTS)
1st Choice	Undergraduate Thesis	1	10
	Undergraduate Internship	1	10
	Choice of Courses	2	10
	Total:	**4**	**30**
2nd Choce	Undergraduate Thesis	0	0
	Undergraduate Internship	1	10
	Choice of Courses	4	20
	Total:	**5**	**30**
3rd Choice	Undergraduate Thesis	1	10
	Undergraduate Internship	0	0
	Choice of Courses	4	20
	Total:	**5**	**30**
4th Choice	Undergraduate Thesis	0	0
	Undergraduate Internship	0	0
	Choice of Courses	6	30
	Total:	**6**	**30**

4. General academic characteristics of the course and the study program

The fields of Dermato-aesthetics are briefly the following:

1. Skin problems such as acne, aging- photoaging, obesity, hirsutism are treated by Aestheticians according to their professional rights.

2. Non-injectable mesotherapy, photo-rejuvenation and advanced facial electrotherapy are new areas of Dermatoaesthetics

3. The progress of thalassotherapy and the development of spa therapy centers (thermal centers) as well as spa tourism have significantly expanded the field of knowledge supported by our division.

4. Modern hair removal methods such as biochemical methods, electrical methods, and laser, are also a subject of Dermatoaesthetics that certify professional rights to graduates from our graduate program in the Direction of Cosmetics And Aesthetic Science, Department of Biomedical Science, UNIWA.

5. Permanent Make Up (P.M.U.) is also a new field of Dermatoaesthetics and Dermatocosmetic science.

6. The assistance of teams consisted of health care scientists such as Doctors, Oncologists, Radiotherapists, Plastic surgeons, Nurses, Psychologists, Physiotherapists, Aestheticians and Cosmetologists for the treatment of side effects on the skin from chemotherapy and radiotherapy in oncology patients is another new field of knowledge of our division.

7. The evolution of Aesthetic Dermatology often brings Aestheticians face to face with people who have undergone medical aesthetic interventions to improve their appearance or treat aesthetic problems. A good knowledge of Dermatology is necessary for Aestheticians and Cosmetologists so that they can safely and effectively perform aesthetic operations, to the extent permitted by the current legislation, to people who have undergone medical aesthetic interventions in accordance with their professional rights.

The fields of Dermato-Cosmetic Science are briefly the following:

1. Research and Development of new cosmetic products.

2. Study of the mechanisms of action of bioactive substances incorporated in cosmetics.

3. Manufacturing of cosmetic products in industrial scale, according to Good Manufacturing Practices and ISO 22721: 2008

4. Quality control (physicochemical methods, instrumental analysis methods, microbiological control, stability tests, compatibility tests), of raw materials, packaging materials, bulk products, finished products and packaging materials.

5. Quality assurance of research, development and manufacturing of new cosmetic products.

6. Efficacy studies and substantiation of claims of cosmetic products.

7. The safety assessment of cosmetic products for consumers, taking into consideration the toxicological profile of ingredients by measuring the NOAEL (No Observed Adverse Effect Level) and Safety Report of finished product.

8. The study and incorporation of natural ingredients in cosmetic products is a new strong trend of modern Cosmetic Science. Research and development of certified Natural and Organic products need special formulation guidelines according, to International Certified bodies such as: ICEA, ECOCERT, BDIH, SOIL, NATRUE etc.

9. Green Cosmetics: The Sustainable Beauty. Modern consumers have a growing global consciousness, and they care about social and environmental responsibility. Eco-friendly products consist of recycled, upcycled materials, biodegradable ingredients, green chemistry, clean fragrances, solid formats, waste reduction, water and energy saving.

10. The development of Cosmeceuticals. Cosmetics that combine classical cosmetic properties with a dermatological action are referred to "Dermocosmetics" or "Cosmeceuticals" or “Dermaceuticals”.

11. A new developing field of Cosmetic Science are the medical devices products. Regulation (EU) 2017/746.

5. Scope of the Curriculum

This MSc program wishes to provide the postgraduate students with best possible combination of scientific and applied knowledge within an educational environment that cultivates the interdisciplinary and scientifically multifaceted search for new expertise. It focuses on cognitive objects:

- In the field of Aesthetics, emphasizing to the multilevel approach for the acquisition of specialized knowledge and skills on modern applications of Aesthetic Science. Therefore, it gives the opportunity to the postgraduate students to play an important role in controlling and maintaining the quality of service implementation in small and medium enterprises. In addition, the modules focus on issues related to the clinical picture, diagnostic criteria and usual methods of manipulating aesthetic problems.
- In the field of Advances in Dermatology dealing with issues related to various skin conditions and with the contribution of an Aesthetician in the treatment of the aesthetic problems that are caused by aesthetic procedures. The module offers basic principles of Aesthetic Dermatology procedures, in order the Aesthetician could provide the appropriate care before-during and after the procedure. Cosmetologist gain the appropriate knowledge for the development of effective Cosmeceuticals (Dermoceuticals), that help the management of skin diseases and aesthetic dermatology procedures.
- In Biomedical Technology provides the aestheticians high expertise of the laser and photonics techniques used for the management of aesthetic treatments i.e. hirsutism.
- The mechanisms of action of bioactive ingredients incorporated in cosmetics or used in cosmetic treatments, and their effect on skin are examined.
- Research and development of cosmetic products (formulation) emphasizing in the development of cosmetic products and mainly solving problems that arise when innovative actives, delivery systems, natural origin compounds are incorporated in finished products.

- The development of cosmetics and medical devices skin products, such as products intended for face care, body acre, hair care, oral care, babe care, sun care, make-up products, intimate care pregnant care, acne to prone skin products, etc.
- The performance of Good Manufacturing Practices (GMP_s) of new cosmetic products for the scale up from lab to industrial scale.
- The Quality Control of cosmetic products
- The Methodology concerning the toxicological safety assessment
- Performance of proper efficacy studies-claim substantiation-Novel Approach Methodologies (NAMs)

After the completion of this MSc program the gradient student will acquire the necessary knowledge in new trends, mechanisms and technologies in the field of Aesthetics, Aesthetic Biomedical Technology and Cosmetic Science and will enhance the ability of new scientists at working in industry and broader job market.

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	POSTGRADUATE STUDIES		
COURSE CODE	**C1.1**	**SEMESTER**	1
COURSE TITLE	ADVANCED DERMATOAESTHETICS I		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	8

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

2. 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 teach students modern approaches to the management of dermatoaesthetic conditions such as acne, wrinkles-aging-photoaging, dryness, etc., the methods of rejuvenation of the skin and the adverse effects of specific treatments that affect the skin and the management of the adverse effects of radiotherapy in oncology patients.
The goal of the course is for students to understand all modern approaches to skin treatments used by aestheticians and to be trained to apply these procedures and to manage various skin conditions such as acne, aging, and skin adverse effects of radiotherapy.

The intended learning outcomes (ILOs) are:

- Methods and protocols for the management of acne by the aesthetician,
- The use of visible light for the treatment of acne
- The over the counter treatment of acne
- The effect of aesthetic procedures in the periocular area and ocular surface
- The effects of radiation therapy on the skin of oncology patients and the management of the adverse effects of the radiation by the aesthetician using the appropriate methods and skin care products a

The advanced aesthetic procedures such as microneedling, dermodermabration, hydrodermabration.

GENERAL COMPETENCES Autonomous work, Group work, work in an interdisciplinary environment, work in an international environment, Production of new research ideas, Demonstration of social, professional and moral responsibility. Respect for the natural environment, promotion of free, creative and inductive thinking.

3. SYLLABUS

1. Acne

Combined methods of treating acne. The establishment of dividing lines through the categorization of the disease. The understanding of the necessity for interdisciplinary cooperation between health professionals for the treatment of the disease. Mode of treatment action using visible light. Photosensitizers - Photodynamic Therapy-Protocols. Over the counter (OTC) treatment.
Over the counter acne treatment

2. **Aesthetic treatments in the eye area - Complications**

Periocular area & ocular surface: Effects of mild cosmetic interventions (artificial eyelashes, make-up, mascara). Ophthalmological complications from the use of injectable aesthetic interventions (Botox, fillers).

3. Radiation therapy and skin effects in oncology patients

Neoplasms of the skin (types, their characteristics) and their treatment, radiotherapy techniques. Transient and permanent side effects of radiation on the skin and skin microbiome. Management by the aesthetician of the adverse effects of radiation therapy, skin care products.

4. Advanced aesthetic procedures

Superficial and Medium Chemical Peels. Non-invasive cosmetic treatment that uses acid to penetrate the superficial (upper) layers of your skin as well as the middle layers, to treat fine wrinkles, acne, uneven skin tone and dryness.
Micro needling, a minimally invasive procedure using thin needles. The procedure can help reduce the appearance of skin concerns such as acne scars, stretch marks or wrinkles.
Microdermabrasion, a non-surgical and non-invasive, controlled treatment that uses microcrystals or diamond to exfoliate the skin.
Dermabrasion-Hydro dermabrasion, an exfoliating skin treatment that uses a liquid (often a saline solution) to loosen the dead skin cells on the top layer of the skin, to improve skin texture and reduce appearance of fine lines.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, et***c**	Synchronous Distance Learning, e-mails, e-class, moodle

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.</td></tr>
<tr><td>TEACHING METHODS
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</td><td>
<table>
<tr><th>Δραστηριότητα</th><th>Φόρτος Εργασίας Εξαμήνου</th></tr>
<tr><td>Interactive teaching</td><td>90</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
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<tr><td>Course total</td><td>120</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure
Language of evaluation, methods of evaluation, summative or conclusive, multiplechoice 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.</td><td>CONCLUSIVE EVALUATION
1) FINAL WRITTEN EXAMINATION (70%): Multiple choice, characterization of sentences as Correct or Incorrect, short answer questions, fill in the blanks, Guidelines for the evaluation of the examination will be given. Language of evaluation: English
2) WRITING AN ESSAY AND ORAL PRESENTATION (30 %)

The criteria of evaluation for the essay are given to the students:
Scientific accuracy of the content (30%)
Structure of the essay (20%),
Scientific sufficiency (20%),
Oral Presentation through network in the digital class (20%)
Scientific sources-Recent Bibliography-last 5 years (10 %)
Language of evaluation: English</td></tr>
</table>

(5)ATTACHED BIBLIOGRAPHY

Suggested bibliography

1. Comprehensive Aesthetic Rejuvenation: A Regional Approach. Jenny Kim, Gary Lask, Andrew Nelson. Informa healthcare press. 1st Edition, 2011. ISBN 978 -0-4154-58948
2. Textbook of chemical peels. Superficial, Medium and Deep Peels in Cosmetic Practice. Philippe Deprez. CRC Press – Taylor & Francis Group. 2nd Edition, 2016. ISBN 9781482223934
3. Management of Complications of Cosmetic Procedures: Handling Common and More Uncommon Problems. Antonella Tosti, Kenneth Beer & Maria Pia De Padova. Springer-Verlag Berlin and Heidelberg GmbH & Co. 1st Edition, 2012. ISBN: 9783642284144

4. Cosmeceutical Science in Clinical Practice. Series in Cosmetic and Laser Therapy. Neil S. Sadick, Mary Lupo, Diane S. Berson, Zoe Diana Draelos. CRC Press – Taylor & Francis Group. 1st Edition, 2019. ISBN: 978- 0367384418. ***Related academic journals:*** Journal of Cosmetics and Laser Therapy, Journal of Clinical and Aesthetic Dermatology, International Journal of Cosmetic Science, Journal of Cosmetic Science

COURSE OUTLINE

1. **GENERAL**

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES- AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	C1.2	**SEMESTER**	1
COURSE TITLE	INNOVATIVE ACTIVE INGREDIENTS IN COSMETICS AND PERSONAL CARE PRODUCTS		
INDEPENDENT TEACHING ACTIVITIES *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*		**WEEKLY TEACHIN GHOURS**	**CREDITS**
	Lectures	2	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

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 is for students to understand the mechanism of action of the innovative active ingredients originating from synthetic chemistry, nature, or biotechnological sources, that are used in skin care and cosmetic formulations.

The influence of these ingredients on the biophysical parameters on human skin, for example, elasticity, microtopography of the skin, and on the biochemical processes concerning aging, such as glycosylation-aging process, oxidative stress and matrix metalloproteinases pathways.

The goal of the course is for the students to learn the Structure-Activity relationship (SAR), the effect of the variation of different structures of the same chemical class on dermal delivery, clinical signs of aging and photoaging, and skin function.

The intended learning outcomes (ILOs) are:

- Chemical Structures and physicochemical properties of innovative bioactive ingredients.
- Mechanisms of interaction of the innovative cosmetic ingredients with the skin biomolecules, its *in vitro* and *in vivo* effects and dermal delivery.
- Legislation regarding the incorporation of new bioactive ingredients
- Applications of Nanotechnology in Cosmetic Science
- Application of Biotechnology in Cosmetic Science
- Overview of raw materials and actives coming from renewable sources
- Skin care products for sensitive skin

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,	*Project planning and management*
with the use of the necessary technology	*Respect for difference and multiculturalism*
Adapting to new situations	*Respect for the natural environment*
Decision-making	*Showing social, professional and ethical responsibility and*
Working independently	*sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*Others.*
Production of new research ideas	

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, Showing social, professional and ethical responsibility and sensitivity to gender issues, Production of new research ideas, Production of free, creative and inductive thinking, Respect for the natural environment

3. SYLLABUS

1. Peptides used in skin care and cosmetic products
   Mechanism of action, Promotion of collagen synthesis, signal peptides, neurotransmitters affecting peptides in cosmetic products, enzyme-inhibitors, anti-acne peptides, proteolytic peptides for the decrease of hirsutism, peptides for the increase of the strength of the hair. Multifunctional peptides, Dermal delivery.
2. Nanomaterials in Dermato-Cosmetic Science
   Physicohemical properties, application and safety of nanomaterials in Dermato-Cosmetic Science. The use of surfactants in the development of nano-delivery systems. The physicochemical stability and the thermodynamic behavior in disperse systems like cosmetic emulsions are explained. Characterization of nano-systems i.e morphology, shape, size, and electric charge. Biomedical application of the nanomaterials. Lyotropic liquid crystals, cubosomes, hexasomes in personal care products. Electron Microscopy, Cryo-Tem Microscopy, 3d-Microscopy and Tomography to self-assembled lipid systems. Penetration ehhancers-Dermal delivery
3. Skin care products and cosmetics for sensitive skin-Neurocosmetics
4. Phytoconstituents as cosmetic ingredients
   Basic principles of Phytochemistry. Extracts, Essential oils-dermato-cosmetic properties. Alternative preservatives. Quality and regulatory aspects. Sustainable Chemistry. Supercritical and Ultrasound Extraction. Organic certification in European Union and Unites States of America.
5. Skin care and cosmetic care products from renewable sources
   Biotechnological origin cosmetic products. Raw materials and active ingredients. Plant derived stem cells. Marine based agents. Products from Algae. By-products of food industry as ingredients in cosmetics. Quality and regulatory aspects. Alternative preservatives.
6. Skin microbiome. Genomics. Anti-aging and anti-oxidants genes. Application of Epigenetics in Dermato-Cosmetic Science. Probiotics in cosmetics. Prebiotics-Quality control. Storage. Regulatory challenges.
7. Hand cleansers and sensitizers
   Hand microbiome, Biocides, Antiseptics, Preservatives. Biocides-Antiseptics and regulatory aspects. Safety. Long-Term Effects, Resistance to the antimicrobial agents. Perspectives.

4. TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Synchronous Distance Learning, -e-mails, e-class, moodle</td></tr>
<tr><td>USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.</td></tr>
<tr><td>TEACHING METHODS
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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Interactive teaching</td><td>90</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
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<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>120</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiplechoice 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.</td><td>CONCLUSIVE EVALUATION
1) FINAL WRITTEN EXAMINATION (70%):
Multiple choice questionnaires, open-ended questions, characterization of sentences as True or False, short answer questions, fill in the blanks questions
Guidelines for the evaluation of the examination will be given.
Language of evaluation: English

2) WRITING AN ESSAY AND ORAL PRESENTATION (30 %)
The criteria of evaluation for the essay are given to the students:
Scientific accuracy of the content (30%)
Structure of the essay (20%),
Scientific sufficiency (20%),
Oral Presentation through network in the digital class (20%)
Scientific sources-Recent Bibliography-last 5 years (10 %)
Language of evaluation: English</td></tr>
</table>

(5) **ATTACHED BIBLIOGRAPHY**

- Suggested bibliography:

1. 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).
2. Hibbot H.W. Handbook of Cosmetic Science: An Introduction to Principles and Applications1483186474, 9781483186474, Elsevier (2016).
3. Mewis J. and Wagner N.J., *Colloidal Suspension Rheology*, ISBN: 9781107622807 Cambridge University Press: Cambridge, UK (2013).
4. Zoe Diana Draelos Cosmetic Dermatology Products and Procedures, Wiley, Blacwell, ISBN 978119676836 (2022)
5. Schlossman M.L. The Chemistry and Manufacture of Cosmetics. Vol 1 Science ISBN-13: 978-1932633474 4th edition, Allured Publishing Co., USA (2008).
6. Schueller R. and Romanowski P. Beginning Cosmetic Chemistry. 3rd edition ISBN-13: 978-1932633535 Allured Publishing Co.,USA (2009).
7. Barton S., Eastham A., Isom A., Mclaverty D., Yi Ling Soong Discovering Cosmetic Science ISBN 978-1782624721 (2020)
8. Cornier J, Ceck CM, Van der Voorde M. Nanocosmetics ISBN 978-3-030-16573-4 (2019) Springer
9. Lourith N., Karl T. Phytocosmetics and Cosmetic Science ISBN 13-978-0367619763 (2021) CRC press

- Related academic journals: International Journal of Cosmetic Science, Journal of Cosmetic Science, Journal of Cosmetic Dermatology, Materials, Processes, Molecules, Antioxidants, Journal of Cosmetic and Laser Therapy

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES- AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	C1.3	**SEMESTER**	1
COURSE TITLE	ADVANCES IN DERMATOLOGY		
INDEPENDENT TEACHING ACTIVITIES *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*		**WEEKLY TEACHIN GHOURS**	**CREDITS**
	Lectures	2	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special*	General background		

background, specialised general knowledge, skills development	
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

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 is for students to understand the morphology, physiology, and immunology of the skin, the mechanisms of aging, the aging face, the aesthetic demands of skin of color and the principles of the often used procedures of aesthetic dermatology for skin treatments and rejuvenation.The scope is for the students to learn the applications and complications of various dermatological and surgical procedures.

The intended learning outcomes (ILOs) are:

- Understanding the role of the aesthetician in consulting towards the optimal method and the significance of the collaboration between plastic surgeons, dermatologists, and aestheticians to produce maximum results.
- Skin physiology-skin Barrier-Topical products influence skin barrier
- Immunology of the skin-Dermatitis.
- Mechanism of aging, Factors affect skin aging-Intrinsic aging, photo-aging
- The demands and sensitivity of skin of colour.
- Rejuvenation techniques using peeling methods with chemical substances: Medium Depth chemical peels-medical peels.
- Injectable anti-aging techniques-post management of the skin by the aesthetician
- Basic principles of aesthetic gynaecology
- Procedures used from the aesthetician in order to prepare and maximize the duration of the effects aesthetical invasive procedures
- Medical devices products used in Aesthetic Dermatology

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, Showing social, professional and ethical responsibility and sensitivity to gender issues, Production of new research ideas, Production of free, creative and inductive thinking, Respect for the natural environment	

3. SYLLABUS

1. Skin

Morphology and Physiology and Histology

Structure of the Skin, Development of Stratum Corneum, Repair Mechanisms, Lipid Human Stratum corneum, Immunology of the skin. Skin Immune Network, Immunological composition of epidermis, implications of skin immune system in Dermato-Cosmetic Science. Differences in the structure, function and physiology of skin of color. Diabetes mellitus and skin-healing. Management of the diabetic skin by the aesthetician-Borderlines

2. Medium Depth Chemical peels - Medical peels

Salicylic acid, glycolic acid, trichloroacetic acid, Phenol, pre-peel and post-peel procedures, Indications for the management of conditions of the skin, Rejuvenation. The role of the aesthetician in consulting towards the optimal method. The role of collaboration between plastic surgeons, dermatologists and aestheticians to produce maximum results. Borderlines

3. Injectable anti-aging techniques

Botulinum Toxins, Fillers-Calcium Hydroxyapatite, hyaluronic acid, poly-L lactic acid, Advantages, Filler selection, Physicochemical properties, advantages and disadvantages of the substances and fillers often used. Autologous fibroblasts, Fat transfer

Thread lifting (Face and Body). Thread materials, responses in thread implantation, anatomic aspects, duration. The role of collaboration between plastic surgeons, dermatologists and aestheticians to produce maximum results. Borderlines

4. Basic principles of aesthetic gynecology- Vaginal rejuvenation Present and Future Perspectives, Consulting, Lasers and energy based devices in aesthetic gynecology, hyaluronic acid fillers, lipofilling. 5. How to maximize the results and duration of cosmetic surgery The role of the aesthetician in the post-operative period. Tools that help making the best out of cosmetic surgery procedures. Latest advances used by aestheticians in post-operation techniques

4 TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td colspan="2">Synchronous Distance Learning, moodle, e-class,</td></tr>
<tr><td>USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td colspan="2">Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.</td></tr>
<tr><td>TEACHING METHODS
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</td><td>Activity
Interactive teaching

Essay writing

Course total</td><td>Semester workload
90

30

120</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiplechoice 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</td><td colspan="2">Language of evaluation: English
CONCLUSIVE EVALUATION
3) FINAL WRITTEN EXAMINATION (70%):
Multiple choice questionnaires, open-ended questions, characterization of sentences as True or False, short answer questions, Fill in the blanks
Guidelines for the evaluation of the examination will be given.
Language of evaluation: English

4) WRITING AN ESSAY AND ORAL PRESENTATION (30 %)
The criteria of evaluation for the essay are given to the students:
Scientific accuracy of the content (30%)
Structure of the essay (20%),
Scientific sufficiency (20%),</td></tr>
</table>

criteria are given, and if and where they are accessible to students.	Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %)

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Zoe Diana Draelos Cosmetic Dermatology Products and Procedures, ISBN 978119676836Willey, Blackwell, (2022)
2. Jonathan Kantor Dermatologic Surgery and Cosmetic procedures in Primary Care, Mac Graw Hill, ISBN 978-1-260-45395-9 (2021)

- Related academic journals:

Journal of Cosmetic Dermatology, Journal of Cosmetics and Laser Therapy, International Journal of Cosmetic Surgery and Aesthetic Dermatology, The Journal of Clinical and Aesthetic Dermatology, American Journal of Dermatology, European Journal of Dermatology and Venerology

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES- AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	C 1.4	**SEMESTER**	1
COURSE TITLE	RESEARCH & DEVELOPMENT OF COSMETICS AND PERSONAL CARE PRODUCTS I		
INDEPENDENT TEACHING ACTIVITIES *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*		**WEEKLY TEACHIN GHOURS**	**CREDITS**
	Lectures	2	8
	Workshop		
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO	Yes		

ERASMUS STUDENTS	
COURSE WEBSITE (URL)	

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 is for the students to understand the basic principles and the typical problems of design, development and formulation, typical problems of formulation and basic principles of production and safety of new cosmetic and other personal care products, which can be marketed in the European market and other countries outside EE, with safety and efficiency for the consumers. The framework of legislation and scientific research of new cosmetics will be in accordance with the European Regulation for cosmetics (EC 1223/2009) and its amendments.

The intended learning outcomes (ILOs) are:

- Criteria of investigation, judgment and evaluation of way of combination of ingredients-Development of formulation
- Solving problems arising during manufacturing process of cosmetics
- Specialization in designing and creating new formulations in both laboratory and industrial scale, new formulations of final cosmetics and other personal care products, such as medical devices for skin care.
- Testing the physicochemical and microbiological the stability of raw materials and final products
- Packaging materials-Compatibility tests regarding packaging materials and bulk products. Evaluation of the marketing claims
- The understanding of clinical studies of cosmetic products.
- The understanding of the toxicity of raw materials and finished products and
- Evaluation the safety assessment of final products to consumers before and after circulation in the international market.

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, Showing social, professional and ethical responsibility and sensitivity to gender issues, Production of new research ideas, Production of free, creative and inductive thinking, Respect for the natural environment	

3. SYLLABUS

1. SKIN MOISTURIIZNG PRODUCTS

a. Natural Moisturizing Factors (NMF). Biochemistry and mechanisms of moisturization of skin. Barrier occlusion. Hydration. Restoration of barrier. Osmo-hydration.
b. Types and definition of products (skin moisturizers). Typical ingredients in skin moisturizing products. Formulation – Examples – Production methods.
c. Stability tests. How is 24-48h moisturization achieved in cosmetic products
d. Typical problems of formulation and manufacturing process.

2. ANTI-AGING PRODUCTS

a. Intrinsic & Extrinsic aging. Biochemical pro-cursors and natural defense mechanisms of skin. Endogenous and exogenous antioxidants. Typical ingredients in antiaging skin products. Formulation – Examples – Manufacturing methods.
b. Typical quality problems of compositions. Latest antiaging mechanisms and active ingredients (Epigenetics, Digital aging, Circadian rhythm, Neuro-inflammation, Plant cells technology etc.). Packaging. Stability tests. Safety issues related to the use of topical non-invasive antiaging ingredients.

3. SKIN CLEANSING PRODUCTS

a. Cleansing products - Basic principles. How can cleansing products affect the skin?
b. Types of surfactants used in personal care products. Effect of pH on

c. personal cleansers. Typical ingredients in skin cleansing products,
d. (skin cleansers) for the face, body and hands.
e. Formulation of skin cleanser products - Examples - Production method
f. Packaging of cleaning products. Stability tests. Safety evaluation.

4. HAIR CARE PRODUCTS

a. Introduction – Structure – Function of human hair. Hair Growth Cycle and Hair Loss.
b. Chemical composition – Hair types.
c. Mechanism of action of cleansing and conditioning agents.
d. Required quality characteristics and consumer needs.
e. Types of products – Active ingredients.
f. Formulation (Shampoos, Conditioners, Masks, Styling products)
g. Methods of Production. Quality control and efficacy of products.
h. Irritancy of surfactants. Safety of final products.

5. SUNSCREEN PRODUCTS

a. Introduction – Photo protection – Prevention of Photo carcinogenesis.
b. Sun Protection Factor (SPF). Water resistance.
c. UVB- UVAI-UVAII-IR radiation.
d. Positive and negative effects of UV radiation on human skin.
e. Required quality characteristics of sunscreens and consumer needs.
f. Chemical Filters – Natural filters- Nano filters.
g. Legislative issues - Concerns about safety.
h. Additional ingredients in sunscreen products.
i. Formulation – Examples – Production method
j. Typical quality problems of formulations.
k. Improving the aesthetics and acceptance of sunscreen products.
l. In vitro, In-vivo measurement of SPF. Packaging – Evaluation.
m. After Sun Products: Formulation – Examples – Production method
n. Self tan products: Mechanism of action. Formulation– Production method.
o. Packaging. Modern trends in Sunscreens products.

6. SKIN BIOCHEMISTRY - FORMULATION FOR SPECIAL POPULATIONS

a. Special requirements: Gender, age, skin color, sensitive skin
b. (eczema, atopic dermatitis, Rosacea), acne, pregnancy,
c. breastfeeding, infants, children.
d. Types of products- Formulation- Examples- Method of production.
e. Efficacy and Safety of products.

7. PRACTICAL APPLICATION (WORKSHOP)

a. Research & Development of a product: Study of necessary ingredients and actives in the designed formula. Study and preparation of Production method –
b. Theoretical Exercise- Requested Quality controls and Safety assessment.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Synchronous Distance Learning, -e-mails, e-class, Interactive video workshop

<table>
<tr><td>USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td colspan="2">Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class, interactive workshops-video</td></tr>
<tr><td rowspan="11">TEACHING METHODS
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</td><td>Activity</td><td>Semester workload</td></tr>
<tr><td>Interactive teaching</td><td>90</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
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<tr><td>Course total</td><td>120</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
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.</td><td colspan="2">CONCLUSIVE EVALUATION
5) FINAL WRITTEN EXAMINATION (70%):
Multiple choice questionnaires, open-ended questions, characterization of sentences as True or False, Short answer questions, Fill in the blanks, problem solving
Guidelines for the evaluation of the examination will be given. Oral examination through network.
Language of evaluation: English

6) WRITING AN ESSAY AND ORAL PRESENTATION (30 %)
The criteria of evaluation for the essay are given to the students:
Scientific accuracy of the content (30%)
Structure of the essay (20%),
Scientific sufficiency (20%),
Oral Presentation through network in the digital class (20%)
Scientific sources-Recent Bibliography-last 5 years (10 %)
Language of evaluation: English</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

*1.*Cosmetic Formulation: Principles and Practice. Heather A.E. Benson, Michael S. Roberts, et al,
ISBN-13: 978-1482235395, Taylor and Francis 2019

2.Introduction to Cosmetic Formulation and Technology. Gabriella Baki, Kenneth S. Alexander ISBN: 978-1-118-76489-3, Wiley 2015

3. Harry's Cosmeticology. Ninth edition, Vol 1, 2,3. ISBN-13: 978-0820601762, SBN-13: 978-0820601779, ISBN-13: 978-0820601786

4 .Cosmetic Dermatology: Products and procedures, 2nd edition ISBN: 978-1-118-65558-0. Editor Zoe Diana Draelos

5. Formulating, packaging and marketing of natural cosmetic products, edited Nava Dayan and L. Kromidas, ISBN:9780470484081, Willey and Sons, 2011

6. http://ec.europa.eu/consumers/cosmetics/cosing/

Related academic journals: International Journal of Cosmetic Science, Journal of Cosmetic Science, Journal of Cosmetic Dermatology, Materials, Plants, Molecules, Pharmaceuticals, Antioxidants

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES			
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE			
LEVEL OF STUDIES	POSTGRADUATE STUDIES			
COURSE CODE	**C2.1**	**SEMESTER**	**2**	
COURSE TITLE	ADVANCED DERMATOAESTHETICS II			
INDEPENDENT TEACHING ACTIVITIES *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*			**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures			2	6
Workshop				
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background			
PREREQUISITE COURSES:	NO			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes			
COURSE WEBSITE (URL)				

2. 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 teach students advanced technology in biomedical devices and modern aesthetic protocols for management of aesthetic problems in line with the most modern methods and in accordance to the legislation regarding to the professional rights to the aestheticians.

The target of the course is for students to understand the increased demands of contemporary

technology advances and its application to human skin. The purpose is for the students to be trained in the innovative applications of electrical skin therapy in the aesthetic domain and learn the effects and side effects of it.

The intended learning outcomes (ILOs) are:

- Multiple factors that lead to obesity-Pathophysiology of obesity
- Lymph system and its abnormalities
- Aesthetic procedures to cope with cellulitis
- Active ingredients and cosmetic formulations used against cellulitis
- Thermalism-spa-thermal centres facilities and spa methods for the treating body issues
- Aesthetic procedures and biomedical technologies performed by the Aesthetician in order to improve body shape

GENERAL COMPETENCES

Autonomous work, Group work, work in an interdisciplinary environment, work in an international environment, Production of new research ideas, Demonstration of social, professional and moral responsibility. Respect for the natural environment, promotion of free, creative and inductive thinking.

3. SYLLABUS

1. Obesity

Obesity a complex disease not just a cosmetic concern. It's a medical problem that increases the risk of other diseases and health problems, such as heart disease, diabetes, high blood pressure and certain cancers. Obesity is a multifactorial resulting from inherited, physiological and environmental factors, combined with diet, physical activity and exercise choices.

2. **Lymph abnormalities**

Pathophysiology, Basal lymphedema, Classification and Grading Types of lymphatic insufficiency. Sequelae of lymphostasis, cell proliferation, compensatory mechanism.

Diagnostic procedures. Lymphedema (diagnosis, progression, treatment). Lipedema, Lipo-lymphedema, Pathophysiology, diagnosis, differential diagnosis, evolution, Therapeutic methods. Cellulitis. Aesthetic procedures. Cosmetic Science and treatment of cellulitis.

3. **Spa Treatments**

Thermal springs-Spa History. Spa Treatment in aesthetics. Thermal waters, active ingredients, elements, cosmetic formulations, muds. Anti-radical, antioxidant, anti-inflammatory and immunomodulatory properties of thermal waters and clays. Thermal spring tourism – medical tourism.

4. Body sculpture

Cryolipolysis: the process in which cold is applied in a controlled manner and for a specific time to the fatty tissue, destroying the fat cells. Acoustic Waves & Shockwaves: Impact Ultrasound is a specialized Medical Aesthetics machine used to combat cellulite and localized fat. The effectiveness of shock wave technology has been proven by clinical studies both in the fight against cellulite and localized fat, and in the face, for skin tightening and elasticity. Protocols applied by the aestheticians for secure combination of the methods for body sculpture.

5. Hand Rejuvenation

. Photoaging, actinic keratoses, fine wrinkles, textural change, thinning of the dermis and subcutaneous fat, skeletal appearance of the hands, with prominent veins and bulging tendons. Methods to treat all these issues include lasers, intense pulsed light devices, fractional devices, fillers, peels, vein sclerotherapy, home treatment. The role of the Aesthetician.

6. Workshop

Lymph massage by the aesthetician (healthy issues)

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc*	Synchronous Distance Learning, -e-mails, e-class, moodle, interactive video workshop
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.
TEACHING METHODS *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*	

Activity	***Semester workload***
Interactive teaching	90
Essay writing	30
Course total	***120***

according to the principles of the ECTS	
STUDENT PERFORMANCE EVALUATION *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.*	CONCLUSIVE EVALUATION 1) FINAL WRITTEN EXAMINATION (70%): Multiple choice, development, characterization of sentences as Correct or Incorrect, short answer questions, fill in the blanks questions, problem solving Guidelines for the evaluation of the examination will be given. Oral examination through network. Language of evaluation: English 2) WRITING AN ESSAY AND ORAL PRESENTATION (30 %) The criteria of evaluation for the essay are given to the students: Scientific accuracy of the content (30%) Structure of the essay (20%), Scientific sufficiency (20%), Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %) Language of evaluation: English

(5) ATTACHED BIBLIOGRAPHY

Suggested Bibliography

1. Disorders of Fat and Cellulite: Advances in Diagnosis and Treatment (Series in Cosmetic and Laser Therapy). David J. Goldberg, Alexander L. Berlin. CRC Press, 1st edition, 2017. ISBN: 978-1138114661
2. Body Composition in Sport, Exercise and Health. Arthur Stewart, Laura Sutton. Routledge – Taylor & Francis Group, 1st Edition, 2012. ISBN: 9780415614986.
3. Concepts of Physical Fitness: Active Lifestyle for Wellness. Charles B. Corbin, Gregory J.Welk, William R. Corbin, Karen A. Welk. McGrow-Hill Companies Inc., 17th Edition, 2013. ISBN: 978-00780579.
4. Beauty, Aging and Antiaging. Ibrahim Vargel, Fatma Figen Ozgur, Arda Kucukguven. Elsevier Science and Technology, 2022. ISBN: 9780323988049.
5. Thermal: Saunas, Hot Springs & Baths. Lindsey Bro. Chronicle Books, 2022. ISBN: 978-1797218571.
6. Guide to Hydrothermal Spa & Wellness Development Standards. Cassandra Cavanah. Global Wellness Institute, 3rd Edition, 2018. ISBN 978-0-578-17820-2.

Related academic journals: Related academic journals: Journal of Cosmetics and Laser Therapy, Journal of Clinical and Aesthetic Dermatology, International Journal of Cosmetic Science, Journal of Cosmetic Science

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	POSTGRADUATE STUDIES		
COURSE CODE	**C2.2**	**SEMESTER**	2
COURSE TITLE	BIOMEDICAL TECHNOLOGY APPLICATIONS IN DERMATOAESTHETICS		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	7
Workshop		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

2. 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 teach students the advanced and specialized technology in biomedical devices and the most modern methods of aesthetic applications.

The course aims for students to understand the increased demands of contemporary technology advances and its application on human skin. The purpose is for the students to be trained in the innovative applications of electrical skin therapy for aesthetic purposes and learn the effect and side effects of its implementation.

The intended learning outcomes (ILOs) are:

- Basic principles of laser and photonics, the legislative framework
- Safety and protection protocols, laser applications

- Laser removal of unwanted hair-Undesirable effects
- Action of non-invasive lasers - Indications - Contraindications - Combined treatments
- Combinations of electric skin therapy methods - Indications and contraindications.
- Non-invasive facial renewal treatments
- Technologies for injecting meso-therapeutic ingredients
- Mesotherapeutic ingredients
- Technologies for lipolysis
- The way the electric stimulus simultaneously activates the skin and the musculature throughout the body,
- Permanent make up (PMU) techniques.

GENERAL COMPETENCES

Autonomous work, Group work, work in an interdisciplinary environment, work in an international environment, Production of new research ideas, Demonstration of social, professional and moral responsibility. Respect for the natural environment, promotion of free, creative and inductive thinking.

3. SYLLABUS

1.Basic Principles of Laser Radiation and Photonics - Laser Safety

The basic issues of photonics and electromagnetic radiation properties. The special characteristics of Laser radiation versus to conventional light sources. The biological effect of Laser radiation on tissues (eye, skin)

Laser Hazard_ Risks other than radiation that may exist when using Lasers. Safety issues – Lasers classes. Protective measures that must be used (laws and regulations (European Union)

2. Laser in Aesthetics

Laser hair removal. Effect of laser on hair growth according to gender and/or age. The role of phototype. Hormone-dependent areas and the follicular response to laser. Reference of Laser devices applied for hair removal- Alexandrite Laser, Long Pulsed ND YAG Laser, Diode Laser, - Photothermolysis (IPL). Wavelength.

Adverse effects resulting from the use of lasers during hair removal and methods of avoiding them. First aid. Update of cases that need to be referred for treatment by a dermatologist.

Non-invasive Lasers: Types of non-invasive lasers (soft lasers). Indications - Contraindications - Therapeutic Effects - Combined action - Side effects - Protective measures - Instructions for before and after application. Differences with invasive Lasers-Advantages-Disadvantages of application. Lipolysis- Laser mechanism of action to treat local thickness and edema-fibro-sclerotic disease of the adipose tissue and to treat epidermal relaxation-scars-discoloration. Mechanism of action of Laser radiation in promotion of collagen synthesis. Combination of Laser with other applications of Electrical Aesthetic Skin Therapy.

3. Innovations in electrical Skin Therapy

Mesotherapy Guns. Technologies for Injecting Mesotherapeutic Ingredients Hydroporation, Endodermis, Cavitation, Cryolipolysis: the process in which cold is applied in a controlled manner and for a specific time to the fatty tissue, destroying the fat cells. Acoustic Waves & Shockwaves. HIFU: Ultrasounds target the myodermal aponeurosis (SMAS), which is also the

target of facelift surgery, by increasing the temperature in the area, causing controlled thermocoagulation, which forces the body to neo-collagenogenesis, increase elastin and rebuild the skin. RF: Radio frequencies are one of the most effective therapeutic methods for treating skin laxity. Combined protocols. It is currently the most modern treatment as it achieves local spot reduction, face-body contouring, reshaping, toning and helps blood circulation.

4. Permanent Cosmetic and Medical Make-up (PMU). Modern developments and best practices

History review. The significance of tattoo globally through ages. Theory of Pigments. Corrective make-up. Change of tattoo color. Dye migration. Modern methods of pigment application. Material and technological equipment. Tattooing devices. Comparative analysis of skin pigment application technologies. Digital tattooing devices. Microblading. Local anesthesia. Skin health condition. Indications – Contraindications. Adverse effects. PMU removal techniques.

Pigments safety and safe use. European regulations. Tattoo after care products. Active ingredients for reducing erythema and enhance the natural regeneration of the skin.

5. Workshop

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc*	Syncronous Distance Learning-e-mails, e-class, interactive workshops videos
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, Web-sessions, Support of the learning process through e-class, Essay writing, Exercises through e-class.
TEACHING METHODS *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*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure*	CONCLUSIVE EVALUATION 1) FINAL WRITTEN EXAMINATION (70%): Multiple choice, characterization of sentences as Correct or Incorrect, short answer questions, problem solving, fill in the blanks

Activity	***Semester workload***
Interactive teaching	90
Essay writing	30
Course total	***120***

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.*	Guidelines for the evaluation of the examination will be given. Language of evaluation: English 2) WRITING AN ESSAY AND ORAL PRESENTATION (30 %) The criteria of evaluation for the essay are given to the students: Scientific accuracy of the content (30%) Structure of the essay (20%), Scientific sufficiency (20%), Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %) Language of evaluation: English

(5) ATTACHED BIBLIOGRAPHY

Suggested Bibliography

1. The Ultimate Guide for Laser and IPL in the Aesthetic Field, Kamal Alhallak , Adel Abdulhafid , Salem Tomi , Dima Omran, Springer, 2023
2. Lasers in Dermatology: Parameters and Choice, Jae Dong Lee , Min Jin Maya Oh, Springer, 2023
3. Procedures in Cosmetic Dermatology: Lasers, Lights, and Energy Devices, Elizabeth L Tanzi & Jeffrey S. Dover & Leah K. Spring, 5th Edition, Elsevier, 2022
4. Minimally Invasive Aesthetic Procedures, Adilson Da Costa, Springer, 2020
5. Laser and IPL Technology in Dermatology and Aesthetic Medicine, Christian Raulin, Syrus Karsai, Springer-Verlag Berlin and Heidelberg GmbH & Co. KG, 2011
6. Textbook of Cosmetic Dermatology, edited by Robert Baran, Howard I. Maibach, CRC Press, 5th Edition 2017
7. Aging Facial Skin: Lasers and Related Spectrum Technologies, An Issue of Facial Plastic Surgery Clinics, David Elli , 1st Edition, 08/2011
8. Aesthetics and Cosmetic Surgery for Darker Skin Types, Pearl E. Grimes, Lippincott Williams & WilkinsUS; 1st edition, 2006
9. The Microblading Bible, Corinne Asch, Createspace Independent Publishing Platform, 2017
10. De Cuyper C Cosmetic and Medical Applications of Tattooing In Cuyper C D Pérez Cotapos S M L Dermatologic Complications with Body Art Springer, Berlin, Heidelberg, 2009

Related academic journals: Journal of Cosmetics and Laser Therapy

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	POSTGRADUATE STUDIES		
COURSE CODE	**C 2 .3**	**SEMESTER**	2
COURSE TITLE	QUALITY CONTROL IN COSMETIC SCIENCE		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	8
Workshop		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

2. 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 teach the students advanced methods of quality control analysis of cosmetics and personal care products, their active ingredients and excipients as well as the determination and quantification of the possible impurities and substances banned for cosmetic products by the appropriate methods of instrumental analysis.
The target of the course is to help students understand the increased demands on quality control-microbiological stability, and production assurance of cosmetics and personal care products in accordance with the guidelines determined by International Organizations, the National Medicines Agency and the European Union legislation.
The intended learning outcomes (ILOs) are:

- Qualitative and quantitative determination of the ingredients in a variety of cosmetic formulations (emulsions, powders, oral hygiene products, etc.).
- Development and validation of new methodologies of analysis (linearity, accuracy, repeatability of the method) for the quantification of the components and impurities.
- Methods of sampling, handling, sampling preparation of cosmetic products for analytical purposes.
- Accreditation, Certification in cosmetic laboratories and institutions

GENERAL COMPETENCES

Autonomous work, Group work, work in an interdisciplinary environment, work in an international environment, Production of new research ideas, Demonstration of social, professional and moral responsibility. Respect for the natural environment, promotion of free, creative and inductive thinking. Project plan.

(3) SYLLABUS

1. Ultraviolet-visible spectrophotometry (UV-VIs), infrared spectroscopy (FT-IR, ATR FT-IR, DRS) and their application in cosmetic products

Ultraviolet-visible spectrophotometry (UV-VIS), Differential UV spectrophotometry. Applications in cosmetic products as: Determination of sunscreen filters. Infrared Spectroscopy (IR), Fourier transform (FT-IR) (advantages). ATR FT-IR (Diffuse Reflectance Spectroscopy (DSR). Practical applications in cosmetic products as: surfactants in shampoos. Quality control of plastic containers of cosmetics and their possible contamination by phthalates

2. High performance liquid chromatography (HPLC) and (HPLC-MS)

Basic terminology and principles of the techniques. Application of high performance liquid chromatography (HPLC) and high performance liquid chromatography coupled to mass spectroscopy (HPLC-MS), in the quality control of chemical compounds that are prohibited or have a concentration limit in cosmetic products. The principles of processing and preparation of a cosmetic product for quality control and quantification. Validation of methodology.Examples in cosmetic products.

3. Determination of toxic heavy metals in cosmetic products by the method of atomic absorption spectrophotometric (AAS) and inductive coupled plasma optic atomic emission spectrophotometry (ICP-OES)

Heavy and toxic heavy metals. Bioaccumulation of heavy metals and effect on health. Legislative framework for heavy metals. Sources of origin of heavy metals in cosmetic products. Pretreatment stages of cosmetic products and wet digestion with acids, wet digestion in a microwave oven and dry digestion. Problems that can arise during the digestion of samples. Preparation of digested samples for the application of the analytical method and the quality control of heavy metals.

Application of the analysis techniques of Atomic Absorption Flame Spectrophotometry (FAAS), Graphite Oven Atomic Absorption Spectrophotometry (GAAS), Atomic Flame Emission Spectrophotometry (AE) and Inductive Coupled Plasma Optic Emission Spectrophotometry (ICP-OES), differences and selection criteria of spectroscopic techniques.

Application of the appropriate method for the determination of heavy metals. Examples in cosmetic products.

4.Introduction in microbiological control of cosmetics-Preservative efficacy testing

Colony Formatting Unit (colony formation unit), phases of development of the population of bacteria. Microorganisms and cosmetics. Common microorganisms of cosmetic products. European criteria for the presence of micro-organisms in non-sterile formulations. Tolerance limits for microbiological testing of cosmetics. Common preservatives of cosmetics to avoid microbial contamination
Challenge test-Preservative Efficacy testing. The biosafety legislation of laboratories- The organization of the microbiological laboratory containment level 2 (biosecurity level [BSL] 2). Green laboratories.

5 . WORKSHOP

- EXERCISE: Quality control of "Methyl/Ethyl/Propylparaben" preservatives with high-performance liquid chromatography with ultraviolet visible detector (HPLC-UV)
- Design of an analytical procedure for the quantification of preservatives
- Preparation of different concentrations of standard solutions of Methyl/Ethyl/Propylparabem for the construction of calibration curve
- Pretreatment of cosmetic emulsion with Ethyl/Ethyl/Propylparaben preservative contents
- Data selection and adjusting of parameters of HPLC for the chromatographic process (solid phase, mobile phase, flow rate, λmax, temperature)
- Download chromatograms
- Statistical processing of the results with (excel) and control of the validated method:
- Calibration curve and regression equation
- Control of linearity of the method (R^2)
- Control of repeatability of the method (coefficient of variation CV%)
- Determination of the detection limit (LOD)
- Determination of limit of the quality (LOQ)
- Calculation of the sample concentration of parabens per gram of cosmetic emulsion

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc*	Synchronous Distance Learning, -e-mails, e-class, interactive videos of experiments performed in the laboratory of Chemistry-Biochemistry-Cosmetic Science
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.
TEACHING METHODS *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.*	

Activity	***Semester workload***
Interactive teaching	90
Essay writing	30

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		
	Course total	***120***
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiplechoice 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.*	Language of evaluation: English CONCLUSIVE EVALUATION 1) FINAL WRITTEN EXAMINATION (70%): Multiple choice, development, characterization of sentences as Correct or Incorrect, short answer questions. Fill in the blanks questions, Problem solving Guidelines for the evaluation of the examination will be given. Language of evaluation: English 2) WRITING AN ESSAY AND ORAL PRESENTATION (30 %) The criteria of evaluation for the essay are given to the students: Scientific accuracy of the content (30%) Structure of the essay (20%), Scientific sufficiency (20%), Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %)	

(5)ATTACHED BIBLIOGRAPHY

Related academic journals: *Journal of Pharmaceutical and Biomedical Analysis,* Journal of Applied Pharmaceutical Sciences and Research, Chromatographia, Journal of Chromatographic Science, Separations, Molecules

Related Academic Books

1. Ecomou A., Current Pharmaceutical Analysis ISSN 1573-4129, 2023
2. R R Badwaik, Shiv Shankar Shukla, Dulal Krishna Tripathi. Introduction to Pharmaceutical Analysis, Pharmamed Press; St ed. edition ISBN 978-9389354195(2019)
3. David C Lee (Editor), Michael L. Webb (Editor) Pharmaceutical Analysis, ISBN: 978-1-405-17299-8, Willey 2009

COURSE OUTLINE

1. **GENERAL**

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES- AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	C 2.4	**SEMESTER**	2
COURSE TITLE	RESEARCH & DEVELOPMENT OF COSMETIC AND PERSONAL CARE PRODUCTS II		

INDEPENDENT TEACHING ACTIVITIES *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*	WEEKLY TEACHIN GHOURS	CREDITS
Lectures	2	9
Workshop		
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

(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 is for the students to understand the basic principles of development and design of new cosmetic and other personal care products, which can be marketed in in both the European market and the rest of the world, under conditions of safety and efficiency for the consumers. The framework of legislation and scientific research on new cosmetics will be in accordance with the European Regulation for cosmetics (EC 1223/2009) and its amendments. Furthermore, the development of medical devices products for skin care will be made according to the new European Regulation (EU) 2017/745.

The intended learning outcomes (ILOs) are:

- Criteria of investigation, judgment and evaluation of way of combination of ingredients-Development of formulation
- Solving problems arising during manufacturing process of cosmetics
- Specialization in designing and creating new formulations in both laboratory and industrial scale, new formulations of final cosmetics and other personal care

products, such as medical devices for skin care.

- Testing the physicochemical and microbiological the stability of raw materials and final products
- Packaging materials-Compatibility tests regarding packaging materials and bulk products. Evaluation of the marketing claims
- The understanding of clinical studies of cosmetic products.
- The understanding of the toxicity of raw materials and finished products and
- Evaluation the safety assessment of final products to consumers before and after circulation in the international market.
- Development of medical devices products for skin care, where the cosmetic claims such as healing, anaplasis, anti-inflammatory, anti-acne treatment etc., cannot be used, but they may be performed by this special category of medical devices-legislation

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, Showing social, professional and ethical responsibility and sensitivity to gender issues, Production of new research ideas, Production of free, creative and inductive thinking, Respect for the natural environment	

(3) SYLLABUS

1. BABY PRODUCTS

a. Anatomy – Physiology of differences between the infant (baby) and adult skin
b. Quality characteristics of products and consumer's needs.
c. Natural origin of actives and low irritancy components.
d. Formulation – Examples – Production method
e. Typical quality problems of compositions.

f. Packaging. Efficacy tests. Dermatologically tests. Safety assessment.

2. HYGIENE PRODUCTS FOR INTIMATE SENSITIVE AREA

a. Anatomy – Physiology of the female genital area.
b. Types of Intimate care products.
c. Mild cleansing agents and low irritancy ingredients
d. Formulation – Examples – Production process
e. Typical quality problems of compositions.
f. Packaging- Evaluation.
g. Intimate Microbiome balance.

3. DEODORANTS AND ANTIPPERPIRANTS PRODUCTS

a. Anatomy – Physiology of sweat glands.
b. Definition and mechanisms of body odor balance.
c. Required quality characteristics and consumer needs.
d. Formulation – Examples – Production process
e. Typical quality problems of compositions.
f. Packaging- Evaluation.
g. Aluminum free- Natural products.
h. Skin microbiome. Modern trends.

4. NATURAL-ORGANIC PRODUCTS

a. Sources: Plants, minerals, microorganisms, algae.
b. Origin of plants (name, origin, cultivation, exploitation)
c. Certification of natural and organic products.
d. Ingredients-Processes-Protocols-Labeling of certification bodies.
e. Sustainability – Ecological responsibility (Eco-friendly cosmetics)
f. Formulation – Examples – Production methods
g. Typical quality problems of compositions.
h. Packaging- Evaluation. Advantages and Marketing issues.

5. LIGHTENING PRODUCTS

a. Types of products. Active ingredients. Mode of action.
b. Formulation – Examples – Production method.
c. Typical quality problems of compositions.
d. Labeling- Packaging.
e. Stability and compatibility studies
f. Ingredients with potential safety issues.
g. Modern trends and legislation

6. ORAL AND DENTAL CARE PRODUCTS

a. Anatomy – Physiology of the human oral cavity.
b. Main oral problems (plaque, tartar, gingivitis, periodontitis, dry mouth,
c. bad breath, bleaching, sensitive teeth)
d. Fluoride Compounds-Limits-Legislation
e. Necessary quality characteristics and consumer needs.
f. Formulation (Toothpastes, mouthwashes - Other products) :
g. Ingredients, rheology, production methods
h. Quality control and Efficacy tests. Relative Dentin Abrasivity (RDA)
i. Packaging- Compatibility tests. Modern trends.

7. MEDICAL DEVICES PRODUCTS FOR SKINCARE

a. Definition. Legislation, Obligations.
b. Types of products – Active ingredients.
c. "Cosmetics-Cosmeceuticals-Medical devices" Separation
d. Mode of action. Categories : CE I,CE IIa, CEIIb, CEIII
e. Formulation – Examples – Production methods
f. Typical quality problems of compositions
g. Biocompatibility. Efficacy studies. Safety assessment.
h. Post Market. Technical dossier for Authorities

8. PRACTICAL APPLICATION (WORKSHOP)

a. Research & Development of a product: Study of necessary ingredients
b. and actives in the designed formula. Study and preparation of Production method.
c. Theoretical Exercise- Requested Quality controls and Safety assessment.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td colspan="2">Synchronous Distance Learning, -e-mails, e-class, Synchronous interactive video performance of experiments</td></tr>
<tr><td>USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td colspan="2">Use of ICT in teaching, web session , Support of the learning process through e-class, Essay writing, Exercises through e-class.</td></tr>
<tr><td rowspan="12">TEACHING METHODS
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</td><td>Activity</td><td>Semester workload</td></tr>
<tr><td>Interactive teaching</td><td>90</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
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<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>120</td></tr>
</table>

STUDENT PERFORMANCE EVALUATION *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.*	**CONCLUSIVE EVALUATION** 7) FINAL WRITTEN EXAMINATION (70%): Multiple choice questionnaires, open-ended questions, characterization of sentences as True or False, short answer questions Guidelines for the evaluation of the examination will be given. Oral examination through network. Language of evaluation: English 8) WRITING AN ESSAY AND ORAL PRESENTATION (30 %) The criteria of evaluation for the essay are given to the students: Scientific accuracy of the content (30%) Structure of the essay (20%), Scientific sufficiency (20%), Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %) Language of evaluation: English

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1.Cosmetic Formulation: Principles and Practice. Heather A.E. Benson, Michael S. Roberts, et al, ISBN-13: 978-1482235395, Taylor and Francis 2019

2.Introduction to Cosmetic Formulation and Technology. Gabriella Baki, Kenneth S. Alexander ISBN: 978-1-118-76489-3, Wiley 2015

3. Harry's Cosmeticology. Ninth edition, Vol 1, 2,3. ISBN-13: 978-0820601762, SBN-13: 978-0820601779, ISBN-13: 978-0820601786

4 .Cosmetic Dermatology: Products and procedures, 2nd edition ISBN: 978-1-118-65558-0. Editor Zoe Diana Draelos

5. Formulating, packaging and marketing of natural cosmetic products, edited Nava Dayan and L. Kromidas, ISBN:9780470484081, Willey and Sons, 2011

6. http://ec.europa.eu/consumers/cosmetics/cosing/
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0745

. ***Related academic journals:*** *International Journal of Cosmetic Science, Journal of Cosmetic* Science, Journal of Cosmetic Dermatology, Materials, Plants, Molecules, Pharmaceutical

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES- AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	C3.1	**SEMESTER**	3
COURSE TITLE	Clinical studies - Safety and Efficacy of cosmetic products		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	10
Workshop		
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

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 is to teach students the *in vitro,* new approach methodologies (NAMs), the *in vivo* -biophysical methods (according to the guidelines of Cosmetics Europe) and the necessary statistical models for the evaluation of the efficacy and safety of cosmetic ingredients/products.
The target of the course is to enable students to organise and apply *in vitro, NAMs* and *in vivo methods* for the evaluation of the effectiveness of cosmetic ingredients/products and to conduct studies for supporting claim substantiation of cosmetics, according to good clinical practice (GCP) and international guidelines and to teach students the basic principles of toxicity-safety testing of raw materials, nano-materials and cosmetic ingredients.
The intended learning outcomes (ILOs) are:

- Sensory and biophysical methods for the evaluation of the efficacy
- Basic statistical models used for the evaluation of the efficacy of cosmetic products
- Design of cosmetic's efficacy clinical studies using biophysical methods, in accordance with good clinical practice (GCP).
- Overview of the *in vitro, NAMs* and *in vivo* toxicity-safety tests of cosmetic ingredients.
- Comparison of the effectiveness of products that "carry" the same claim of action and comparison of the applied evaluation methods for the same action.

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, Project planning and management, Search for, analysis and synthesis of data and information, with the use of the necessary technology, Showing social, professional and ethical responsibility and sensitivity to gender issues, Production of new research ideas, Production of free, creative and inductive thinking, Respect for the natural environment. Ethical Research.

3. SYLLABUS

1. Design of clinical trials

Biostatistics: Pragmatic and explanatory ct, controlled (rct)s uncontrolled clinical trials: strengths and limitations, parallel design, cross-over designs, withdrawal studies, factorial design, adaptive allocation design. examples in aesthetics and cosmetics
randomization process, bias reduction (blinding), rct design and statistical analysis: power and sample size determination, statistical analysis plan (sap) of clinical trial -types of end point, one sample problem two sample problem, k-sample problem

2. Efficacy and safety in cosmetics: clinical studies

Introduction to clinical studies. fundamentals in clinical studies and clinical trials. why, how and when they are necessary and who participates in them. historical, legislative and scientific background. Clinical studies in cosmetics: requirements and implementation. principles, guidelines, directives, types, rationale and pathways in conducting clinical studies in cosmetic products. designing a clinical study in cosmetics: protocols and examples. good clinical practice (GCP) certification procedures. Basic clinical designs in acquiring evidence for the efficacy and safety of cosmetics products.
3 .*In vitro* methods for the evaluation of efficacy of cosmetic products and cosmetic ingredients. *In vivo* methods for the evaluation of cosmetic products. Evaluation of Safety of Cosmetic products-Novel Approach Methodologies (NAMs)

Biophysical Methods-Human volunteers (Cosmetics Europe): Analysis of skin surface topography (Optical and Laser Profilometry). Surface Evaluation Parameters of Living Skin (SELS). Determination of stratum corneum hydration-transdermal water loss – Sebum-melanin- erythema. Skin elasticity. Skin analysis. Methods for the evaluation of sunscreens. (SPF-UVA protection). Ultrasound methods for measurement of skin thickness. Methods for the determination of dermal absorption. Overview of classical approaches and a detailed description of alternative to animal testing methods, that have been developed and validated for safety of cosmetic ingredients. Emerging technology for skin imaging and assessment. New Approach Methodology (NAMs), *in vitro* methods. Scientific Society for Consumer Safety (SCCS). The relevant legal framework and concerned international bodies will also be introduced. The Adverse Outcome Pathway (AOP) conceptual framework.

4. Introduction in safety of nanocosmetics

Safe application of nanoscience in cosmetic formulation. The global regulatory landscape for the use of nanosystems as cosmetic ingredients and the main safety concerns for health and the environment will be indicated. Advanced characterization techniques used for safety evaluation of nanosystems in cosmetics and for better control of the desired characteristics, such as morphology shape, charge and size.

5. Workshop

Synchronous Performance of in vitro experiment
Analysis-Description-Performance of In vivo experiments supporting the efficacy of cosmetic products (video)-Interactive

4.TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Distance Learning-e-mails, e-class, interactive video of experiments-Workshop	
USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, web session , Support of the learning process through e-class, videos of lectures of the course under the auspices of the Institution, Essay writing, Exercises through e-class.	
TEACHING	***Activity***	***Semester workload***

METHODS *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*	Interactive teaching	90
	Essay writing	30
	Course total	*120*
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiplechoice 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.*	CONCLUSIVE EVALUATION 9) FINAL WRITTEN EXAMINATION (70%): Multiple choice questionnaires, open-ended questions, characterization of sentences as True or False, short answer questions, fill in the blanks, problem solving Guidelines for the evaluation of the examination will be given. Language of evaluation: English 10) WRITING AN ESSAY AND ORAL PRESENTATION (30 %) The criteria of evaluation for the essay are given to the students: Scientific accuracy of the content (30%) Structure of the essay (20%), Scientific sufficiency (20%), Oral Presentation through network in the digital class (20%) Scientific sources-Recent Bibliography-last 5 years (10 %) Language of evaluation: English	

5 ATTACHED BIBLIOGRAPHY

Suggested Bibliography

1. Dreher F, Jungman E. , Sakamoto S. . Maibach HI. Handbook of Cosmetic Science and Technology ISBN 9780367469979 (2022)
2. Loprieno N. Alternative Methodologies for the Safety Evaluation of Chemicals in the Cosmetic Industry ISBN 13-978-0367246624, CRC (2020)
3. Elsner P, Maibach HI., Merch HF. Controlled Efficacy studies and Regulation ISBN: 978-3-642-59869-2
4. https://health.ec.europa.eu/scientific-committees/scientific-committee-consumer-safety-sccs_en

- ***Related academic journals****:* International Journal of Cosmetic Science, Journal of Cosmetic Science, Journal of Cosmetic Dermatology, Cosmetics, Journal of Cosmetics and Laser Therapy, Journal of Pharmacology and Toxicology, Methods in Consumer Research, International Journal of Toxicology

COURSE OUTLINE

(1) **GENERAL**

SCHOOL	SCHOOL OF HEALTH AND CARE SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF BIOMEDICAL SCIENCES-AESTHETICS AND COSMETIC SCIENCE		
LEVEL OF STUDIES	POSTGRADUATE STUDIES		
COURSE CODE	**C3.2**	SEMESTER	3
COURSE TITLE	THESIS		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Review of existing literature		**20**
Experimental procedure		
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	**Skills development**
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	**English**
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	

(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 master thesis is an integral part of the overall educational process and a prerequisite for the successful completion of the master program. The aim of the master thesis is to educate the student in order to expand his knowledge, to help him assimilate new knowledge and express it correctly, to participate in research protocols and to learn how to analyze research data. In addition, during the master thesis, the student will develop the ability to contribute to the scientific dialogue and to participate in variable

research procedures. In particular, among the aims of the master thesis are the following:

- selection, analysis and presentation of a research topic
- planning of a research procedure
- critical review of the relevant literature on a topic of choice
- identification of the relevant general research questions.

The thesis can be either research project or research-review of the literature. Research work is preferred, as long as research reagents can be provided by the Department of Biomedical Sciences or by a cooperating university department or institution or cosmetic industry. Moreover, the master program can finance the research, in means of covering part of the consumables required for the master thesis, after the request of the supervisor and the agreement of the Steering Committee. Our students are strongly encouraged to undertake a research thesis, in order to be gradually prepared for a future Ph.D. thesis at the Department of Biomedical Sciences. The laboratory work for the thesis will be carried out in Department of Biomedical Sciences-UNIWA, Laboratories of Cosmetic Industry, in Aesthetics centers, as well as in medical dermatological institutes and University Hospitals in Greece or abroad after the appropriate agreement..

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,	*Project planning and management*
with the use of the necessary technology	*Respect for difference and multiculturalism*
Adapting to new situations	*Respect for the natural environment*
Decision-making	*Showing social, professional and ethical*
Working independently	*responsibility and*
Team work	*sensitivity to gender issues*
Working in an international environment	*Criticism and self-criticism*
Working in an interdisciplinary environment	*Production of free, creative and inductive thinking*
Production of new research ideas	*……*
	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology, Working independently, Working in an international environment Working in an interdisciplinary environment, Production of new research ideas, Project planning and management , Showing social, professional and ethical responsibility and sensitivity to gender issues , Production of free, creative and inductive thinking

(3) **SYLLABUS**

The master thesis elaboration is divided in the following parts:

1. Collection of the required information by studying the available literature-Introduction-State of the art.
2. The experimental section, if it is required from the subject of the thesis.
3. Writing of the thesis, where the major themes highlighted by the study of the relative literature, and/or the data obtained from the experimental procedure will be thoroughly summarized.
4. Conclusion
5. Future perspectives

The value and impact of the thesis are not determined by the number of pages, although a minimum number of pages is required. The main body of the master thesis must contain a predefined number of words in order to be considered complete and sufficient. In particular, 15,000 words are defined as the minimum number of words, without including the bibliography, figures, tables, etc. The acceptance of the master thesis lies on the supervisor and the Thesis Coordinator, while the three-member examining committee (including supervisor) also decide for the adequate coverage of the research topic.

The quality of the scientific work defines the greater or lesser acceptance and the success of the thesis. Quality should dominate among other criteria.

5. TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Distance learning, e-mails, moodle, research project</td></tr>
<tr><td>USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>e class, moodle, web session, e-mails</td></tr>
<tr><td>TEACHING METHODS
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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Study, bibliography analysis</td><td>150</td></tr>
<tr><td>Project – analysis, research, design, simulation, evaluation</td><td>600</td></tr>
<tr><td>Writing the thesis</td><td>150</td></tr>
<tr><td></td><td></td></tr>
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<tr><td>Course total</td><td>900</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION
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.</td><td>Language of evaluation English
Written work
Oral examination, public presentation,

Criteria of evaluation
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<tr><td>Content Validity</td><td>30%</td></tr>
<tr><td>Structure of thesis</td><td>10%</td></tr>
<tr><td>Scientific sufficiency</td><td>10%</td></tr>
<tr><td>Innovative elements and research perspectives</td><td>30%</td></tr>
<tr><td>Presentation</td><td>20%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
</table>

5.ATTACHED BIBLIOGRAPHY

Suggested bibliography:

1. How to write and publish a scientific paper. B Gastel, RA Day – 2016, Greenwood.
2. How to write a paper GM Hall, Z Sestak – 2003, Willy Blackwell.
3. Analyzing the Past to Prepare for the Future: Writing a Literature Review Jane Webster and Richard T. Watson. MIS Quarterly Vol. 26, No. 2 (Jun., 2002), pp. xiiixxiii.