

PROSPECTUS

UNIVERSITY STUDY PROGRAMME COSMETOLOGY UNIVERSITY OF LJUBLJANA, FACULTY OF PHARMACY

Presentation of the study programme:

1. Information on the study programme:

University study programme *Cosmetology* lasts 3 years (6 semesters) and comprises 180 credit points (ECTS).

The academic title awarded to the students is diplomirani kozmetolog (UN); dipl. kozmet. (UN) (Bachelor of Cosmetic Sciences).

2. Fundamental objectives of the programme and general competences

The main objective of the undergraduate university study programme *Cosmetology* is to train skilled professionals for jobs in cosmetic industry, regulation and inspection services, research institutions, representative offices with cosmetic products, and in cosmetic product consultation and marketing within different institutions. Graduates will be able to follow independently scientific achievements in the field of cosmetology and adapt them to the needs in their professional and research areas. The programme provides foundations for further studies at master's and/or specialist level and for lifelong technical and scientific training.

It also provides knowledge about biological bases of the human body, types, composition and production of various cosmetic products, their effects on the skin or outer body parts, control of their quality, safety and efficiency as well as the regulations relating to the cosmetic product supervision, marketing and advertising.

General competences:

- understanding the theoretical bases of natural sciences and developed ability of natural scientific thinking;
- ability to transfer and use theoretical knowledge in practice and solve problems;
- ability to experiment and provide different concepts of thinking;
- ability to interpret acquired knowledge, ability of independent learning and innovative involvement in the selected field of expertise;
- initiative and independence in performance of certain tasks;
- ability to communicate with the co-workers and experts of related disciplines, and active participation in the team-work.
- capacity to perform individual professional and research work, to work in a team and possess knowledge needed for communication and publication of results;
- proper skills for understanding, introduction, application and evaluation of modern techniques and methods for the use in the professional and research fields of cosmetology, ability to search for and classify new information;
- ability to use the state-of-the-art computer and information tools, competences and skills that are present in everyday professional work;
- developed professional ethical responsibility;
- developed health responsibility concerning care and maintenance of good body condition with regard to the principles of cosmetology;

- developed ecological awareness.

3. Enrolment requirements and selection criteria in case of restricted enrolment

University study programme Cosmetology is intended for the candidates:

- a) who have passed matura examination;
- b) who have passed vocational matura examination in any high school programme, and chemistry or biology exam within the matura examination. If the candidate has passed one of the courses within the vocational matura examination, he/she is obliged to choose the exam for the other required course.
- c) who completed any four-year secondary programme prior to June 1st 1995.

In case of restricted enrolment,

candidates under points a) and c) will be selected based on:

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| -general success in the matura or final school examination | 60% of points |
| -general success in years 3 and 4 | 40% of points |

candidates under point b) will be selected based on:

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|---|---------------|
| -general success in the vocational matura examination | 40% of points |
| -general success in years 3 and 4 | 40% of points |
| -success in matura subject | 20% of points |

4. Criteria for recognition of knowledge and skills acquired prior to the enrolment in the programme

Upon the candidate's request, the Academic Affairs Commission may submit to the FFA Senate a proposal for recognition of knowledge and skills acquired by the candidate prior to entering the study programme, which may be recognised within the study programme Cosmetology as part of study obligations and shall be evaluated with a proper number of credit points. Evaluation is subject to Rules of procedure and criteria for recognition of informally acquired knowledge and skills adopted by the UL Senate on its session of 29 May 2007.

5. Requirements for advancement within the programme

- Requirements for advancement from one year to another:

Students may enrol in the next year of study if they complete by the end of the year all the obligations determined in the curriculum for the enrolment in the next year.

To be able to advance to the second year, students must meet all academic requirements laid down in the curriculum and first year course schemes in the amount of 60 ECTS credits.

To be able to advance to the third year, students must meet all academic requirements laid down in the curriculum and second year course schemes, with the exception of optional course. This means they have to collect no less than 55 ECTS credits for the second year.

- Requirements for repetition of a year and exceptional advancement to the next year:

During their studies, students are allowed to repeat a year once provided they have met half of the requirements for the attending year, which amounts to no less than 30 ECTS credits.

During their studies, students are entitled to one exceptional enrolment in the next year even if they have not fulfilled all the obligations set in the study curriculum. This is decided upon by the FFA Academic Affairs Commission which can, according to article 153 of the UL Statute and the FFA Academic Regulations, allow exceptional advancement when it determines the student has failed to fulfil required conditions due to substantial and verified reasons.

6. Requirements for completion of study

To complete the study programme and gain the title diplomirani kozmetolog (UN) / diplomirana kozmetologinja (UN) (Bachelor of Cosmetology – UN), the candidate must successfully meet all the obligations laid down in the curriculum in total amount of 180 ECTS credit points.

7. Transfers between study programmes

- Transfers between the university education study programmes within the UL
Students from the 1st cycle UL university programmes of natural science, medicine/healthcare or biotechnology fields may transfer to the 2nd year of the university programme Cosmetology, provided they have gathered 60 ECTS credits within the academic obligations of the attended programme. Academic Affairs Commission may determine the missing obligations for the 1st year of the university study programme Cosmetology and the deadlines for the student to fulfil them.

- Transfers from higher education study programmes
Direct transfers of the students from higher education study programmes are not envisaged.

- Transfers between the professional high education study programmes within the UL
Direct transfers of the students from professional high education study programmes are not envisaged.

- Transfers between the study programmes of other universities
To be able to transfer to the second or higher year of the university study programme Cosmetology, one has to be a student of the university study programme Cosmetology or a related programme at some other university, provided they meet the requirements for the enrolment in the next year that apply to the study programme they are enrolled in. The FFA Senate approves the advancement on a proposal from the FFA Academic Affairs Commission that also determines a year the student may enrol in, potential bridge exams or other obligations and deadlines to fulfil them.

- Transfer between the FFA programmes
Provided they have gathered the required 60 ECTS credits in their current study programme, the students of the uniform master's pharmacy programme or university study programme Laboratory Biomedicine may transfer to the 2nd year of the university programme Cosmetology. Academic Affairs Commission determines the missing obligations for the 1st year of the university study programme Cosmetology and the deadlines for the student to fulfil them.

8. Assessment schemes

Each course has its own assessment scheme which is set in the course curriculum. Assessment schemes include oral and written exams, partial exams, seminar papers, etc.

The assessment scale ranges from 6 – 10 (positive) and 1 – 5 (negative). Assessment is subject to the provisions laid down in the Statute of the University of Ljubljana and FFA Academic Regulations.

9. Programme curriculum:

First year		Contact hours				ECTS
		L	S	P	O	
Semester 1		240	90	45	0	30
1.	<u>Mathematics with Statistics</u>	45	0	15	0	5
2.	<u>General and Organic Chemistry</u>	75	60	0	0	11
3.	<u>Physics</u>	60	0	30	0	7
4.	<u>Introduction to Cosmetology</u>	30	30	0	0	5
5.	<u>Cosmetic Products I.</u>	30	0	0	0	2
Semester 2		135	60	150	0	30
6.	<u>Anatomy and Histology</u>	30	0	30	0	5
7.	<u>Cellular Biology and Genetics</u>	45	15	30	0	8
5.	<u>Cosmetic Products I.</u>	60	45	90	0	17
Total		375	150	195	0	60

L – lectures; S – seminar; P – practice; O – other forms of direct pedagogical work (especially project work); ECTS – European Credit Transfer System (1 credit point equals to 25-30 hours of student workload)

Second year		Contact hours				ECTS
		L	S	P	O	
Semester 3		180	90	90	0	30
8.	<u>Biochemistry</u>	30	15	15	0	5
9.	<u>Basics of Dermatology</u>	60	30	30	0	10
10.	<u>Cosmetic Products II</u>	45	30	45	0	10
11.	<u>Toxicology</u>	45	15	0	0	5
Semester 4		180	105	60	15	30
10.	<u>Cosmetic Products II</u>	30	30	0	0	5
12.	<u>Natural Cosmetic Ingredients</u>	30	15	15	0	5
13.	<u>Packaging and Stability</u>	30	15	15	0	5
14.	<u>Skin Immunology with Immunochemistry</u>	30	15	15	0	5
15.	<u>Instrumental Analysis in Cosmetic Science</u>	30	15	15	0	5
	<u>Optional Course I</u>	30	15	0	15	5
Total		360	195	150	15	60

Third year		Contact hours				ECTS
		L	S	P	O	

Semester 5	195	75	60	30	30
16. Nanotechnology in Cosmetology	60	0	30	0	8
17. Evaluation of Cosmetic Products	45	30	15	0	7
18. Biotechnology in Cosmetology	30	15	15	0	5
Optional Course II	30	15	0	15	5
Optional Course III	30	15	0	15	5
Semester 6	65	15	30	95	30
19. Phenomena on Border Surfaces	45	15	30	0	8
20. Individual Project Work	20	0	0	80	17
21. Thesis Defence	0	0	0	15	5
Total	260	90	90	125	60

Optional Courses	Contact hours				ECTS
	L	S	P	O	
22. Toxicology of Cosmetic Ingredients	30	15	0	15	5
23. Nutritional supplements	30	15	0	15	5
24. Skin and Metabolic Disorders	30	15	0	15	5
25. <u>Reactive Intermediates in the Skin and Antioxidants</u>	30	15	0	15	5
26. Cellular and Tissue Cultures	30	15	0	15	5
27. Physiology	30	15	0	15	5
28. Field-Specific English	30	15	0	15	5
29. Microbiology	30	15	0	15	5
30. Cosmetics in Sports	30	15	0	15	5
Total	270	135	0	135	45

10. Information on available optional courses and mobility

Optional courses offer in-depth knowledge from specialised fields with respect to students' interest and desired profession. In addition to specific optional courses available at the FFA, students can choose from courses in the fields of natural science, medicine, healthcare and biotechnology as well as marketing, management, communicology, psychology, design, patent law and intellectual property, which are provided within the study programmes of other UL members or other universities. General optional course which does not fall under the above mentioned fields is approved by the pro-dean responsible for the field of study.

The conditions for the admission into certain course are provided in individual curricula. The percentage of selected optional courses in the programme is 3/24 (12.5%) or 15/180 ECTS credits (8.3%). Optional units include also individual project work whose percentage in the programme represents 17/180 ECTS credits (9.4%). In total, optional courses amount to 17.8%. Students can choose from external courses in the third year.

According to point 6 of *Criteria for credit evaluation of study programmes*, students can, due to mobility, transfer no less than 10 ECTS credits gathered within programme obligations and optional units from one study programme to another.

11. Presentation of individual courses

1. *Mathematics with Statistics (5 ECTS credits):*

Functions. Derivative, geometric and physical meaning of the derivative, function extremes, use of the derivative and differential, high derivatives. Multivariable functions, partial derivatives, regression. Indefinite and definite integral, numerical integration. Events, definition of probability, sequences of independent experiments, random variables, discrete and continuous distributions, normal distribution, average value, standard deviation, correlation. Introduction to statistics, population and pattern, presentation of statistical data, evaluation of parameters.

2. *General and Organic Chemistry (11 ECTS credits)*

General chemistry: basic chemical terms and laws, structure of atoms and molecules, disperse systems, proteolytic balances in aqueous solutions, redox processes, biologically relevant elements and their compounds. Organic chemistry: structural characteristics of organic compounds, organic reactions (types, mechanisms, acids, bases, tautomerism), conversions of organic compounds (alkanes, alkenes and alkynes, alkyl halides and alcohols, aldehydes and ketones, carboxylic acids and derivatives, aromatic compounds, heterocyclic compounds), organic compounds of biological significance (carbohydrates, amino acids, peptides and proteins, nucleic acids, vitamins and coenzymes, lipids).

3. *Physics (7 ECTS credits)*

Measuring: physical quantities, unit systems. Kinematics: speed, acceleration, straight and circular movement, equilibrium, Newton's laws, work, energy. Solid mechanics: elastic and plastic deformation, pressing, stretching, shearing. Fluid mechanics: solids and liquids, hydrostatics, (hydrostatic pressure, buoyancy, surface tension, border angle), hydrodynamics (Bernoulli equation, viscosity, Poiseuille's law). Thermodynamics: temperature, heat, internal energy, energy conservation law, calorimetry, phase transitions, effect of temperature on a living substance. Electricity: electric field, current, energy and power, physiological reaction to electric current. Optics: light as electromagnetic waves, geometrical optics, photometry, effect of light on biological tissues. Oscillation and wave. Sound.

4. *Introduction to Cosmetology (5 ECTS credits)*

History and role of cosmetics. Classification of cosmetic products, packaging and advertising. Development of cosmetic products: scientific bases, technology, development trends, quality and quality control. Care, decorative and active cosmetics. Distinction among cosmetic products and medicinal products / medical devices / nutritional supplements. Legislation (European and Slovenian), Cosmetics Act and applicable regulations, practical implementation of the legislation, adaptation of the legislation according to technical progress. Professional associations from the field of cosmetology.

5. *Cosmetic products I (19 ECTS credits)*

Basic technological operations (mixing, grinding, emulsifying) and physicochemical bases of cosmetic product design. Types, composition and production of cleansing, care and make-up cosmetic products for face and body: creams, emulsions, lotions, gels and oils for the skin (multiphase systems, surface active compounds, production, equipment); facial masks; colour foundations; hygienic and make-up powders; toilet and deodorant soaps; shower and bathing products; eye and face make-up and make-up removers; lip cosmetics; sun protection products (UV rays, vitamin D, skin cancer, SPF test); anti wrinkle products.

6. *Anatomy and Histology (5 ECTS credits):*

Anatomy of musculoskeletal apparatus, nervous system, cardiovascular system, respiratory tract, digestive tract, urinary tract, male and female genital organs. Histology: epithelia, connective tissue, cartilaginous tissue, bone tissue, muscular tissue, nerve tissue, skin, cardiovascular system, blood, lymphatic system, respiratory system, digestive tract, urinary tract, male and female genital organs, endocrine system, senses, development and growth of an organism.

7. Cellular Biology and Genetics (8 ECTS credits)

Composition and function of cell, cellular organelles. Nucleus: chromatin, chromosome, gene, allele, genetic polymorphism; cellular biological foundations of Mendelian genetics, types of inheritance, genealogy, basics of molecular genetics and cytogenetics. Cell cycle, mitosis, meiosis. Cell proliferation and cell death: apoptosis and necrosis. Embryonic stem cell; cell potency and differentiation; cell types and integration in tissues. Skin cells. Function of skin in physiological and pathological conditions.

8. Biochemistry (5 ECTS credits):

Biomolecules: water; amino acids, peptides, proteins and enzymes (composition, characteristics and biological role, enzyme reactions), carbohydrates (mono-, di-, oligo-, polysaccharides, glycoproteins); lipids (cell membranes, transport, signal transfer); hormones; nucleic acids. Metabolism: catabolism and anabolism; metabolism of carbohydrates, amino acids, fatty acids and lipids; hormonal regulation of metabolism. Storage and transfer of genetic information: structure of chromosomes and genes, DNA replication and transcription, RNA, the genetic code, protein synthesis and synthesis regulation, recombinant DNA.

9. Basics of Dermatology (10 ECTS credits)

Composition, function and immunological role of skin. Skin papules, diseases and their diagnosis. Erythematous desquamative dermatoses; sebaceous gland, hair and nail diseases; *infectious skin diseases*; reactive and allergic skin diseases; nevi, skin tumors and pigmentation disorders; peripheral vascular disease; erythema; physical and chemical skin damages; sexually transmitted diseases. Local and systemic skin disease therapy. Dermatological cosmetology.

10. Cosmetic products II (15 ECTS credits)

Types, composition and production of cosmetic products for hair, nails, teeth, oral cavity and mucous. Hair care products: hair tints and bleaches, products for waving, straightening and fixing the hair, hair setting lotions, hair cleansing products, hair conditioning products, hairdressing products; products for nail care and make-up; perfumes, toilet waters and eaux de Cologne; deodorants and antiperspirants; shaving products; depilatories, products for care of the teeth and the mouth; products for external intimate hygiene; products for tanning without sun; skin whitening products.

11. Toxicology (5 ECTS credits):

Definition, structure, classification and functioning of toxic substances. Effect of metabolism on substance toxicity. Genotoxic, carcinogenic and co-carcinogenic substances. Immunotoxic substances. Toxic gases: carbon monoxide, hydrogen cyanide, hydrogen sulphide, sulphur dioxide, singlet oxygen, ozone, nitrogen oxides. Heavy metal toxicity. Organic solvents: aliphates, aromatics, halogenated hydrocarbons, alcohols, ethers, aldehydes, ketones and esters. Pesticides: insecticides, herbicides, fungicides and rodenticides. Carbamic acid organophosphates and derivatives. Chemical weapons, protection. Addiction causing substances and illegal narcotics. Biological, instrumental and chemical analysis of toxic substances.

12. Natural Cosmetic Ingredients (5 ECTS credits)

Properties and chemical structure of natural cosmetic ingredients. Biological production, identification and quality of input ingredients. Problems of production. Preparation methods for herbal preparations; qualitative and quantitative determination of content of preparation ingredients; chemical analysis. Phytochemical compounds: lipids, saccharides, glycosides, phenols, terpenes, etheric oils, alkaloids. Classification of natural cosmetic ingredients: oils, fats and waxes; polysaccharides; fragrances and etheric oils; colouring matter; active care ingredients; abrasives; antioxidants. Legal aspects of natural cosmetic ingredients in Europe and Slovenia.

13. Packaging and Stability (5 ECTS credits):

Significance of packaging and stability for ingredients and final products; legislative provisions; preservation assurance. Stability testing; instability factors and indicators; stability analysis and control. Role and composition of packaging; packing materials: plastic materials, films, foils, laminates, glass and metal materials. Design, selection and quality evaluation of packaging; packaging for solid, semi-solid, liquid and sterile products. Technological packaging procedures, packaging hardware. Packaging integrity, assurance of stability from production to application.

14. Skin Immunology with Immunochemistry (5 ECTS credits)

History of immunology. Immunobiology: defense mechanisms, complement, immune system composition, congenital and acquired immunity. Structure, production and properties of antibodies; *antigen-antibody* reactions; chemical and epitope properties of antigens and immunogens. Cell receptors; signalling and activation of immune response; cytokines; antigen presentation. Effector system of humoral and cellular immunity; cytotoxicity in delayed hypersensitivity. Immune homeostasis; genetic and neuroendocrine regulation of immune response; immune non-responsiveness and tolerance. Specificities of skin and mucous immunology.

15. Instrumental Analysis in Cosmetic Science (5 ECTS credits)

Analytical methods: classification, valuation, validation. Sample preparation; measuring; statistical treatment of data; expression of results; errors. pH-metry: acids, bases, buffer solutions, indicators, pH electrodes, standardization. Electrochemical methods: oxidants, reducing agents, standard potential; potentiometry, voltammetry, amperometry, coulometry, conductometry. Spectroscopic methods: UV-VIS spectroscopy, IR spectroscopy, atomic absorption spectroscopy, fluorescence, nuclear magnetic resonance. Separation methods: electrophoresis, liquid chromatography, gas chromatography and planar chromatography. Thermal analyses: thermogravimetry, dynamic differential calorimetry, isothermal microcalorimetry.

16. Nanotechnology in Cosmetology (8 ECTS credits)

Historical development, interdisciplinarity and ethical aspects of nanoscience and nanotechnology. Technological approaches to nanosystem design: nanoparticles, liposomes, microemulsions, multifunctional emulsions. Nanoencapsulation of flavourings, fragrances and vitamins. Nanocoating. New ingredients: biolipids, nano-organic gels and biopolymers. Preparation of antibacterial and self-cleaning surfaces. Integration of proteins and peptides in cosmetic products for stimulation of own production of collagen and extracellular matrix proteins. Nanoparticles in skin cosmetic products.

17. Evaluation of Cosmetic Products (7 ECTS credits)

Performance of cosmetic products; indication of effects; legal provisions. Evaluation of toxicity (toxicological studies on animals, *in vitro* – alternative methods), safety (clinical testing on volunteers), efficacy (clinical and biometric evaluation) and sensory profile of cosmetic products (general and analytical methods). Customer perception; psychological effect of perception. Perfumes: basics, composition, types of fragrances.

18. Biotechnology in Cosmetology (5 ECTS credits)

Historical overview of biotechnology. Skin and skin tissues from the perspective of biotechnology: performance regulation, macroangiopythies, inflammatory processes. Biological medicinal products: types, properties, production and application in skin and mucous therapy and care; recombinant insulins, erythropoietins, interferons, interleukins, cytokines, monoclonal antibodies, secondary metabolites. Biotransformations. Cellular and tissue skin engineering. Ethics and regulations in pharmaceutical biotechnology.

19. Phenomena on Border Surfaces (8 ECTS credits)

Intermolecular forces; electrical double layer; DLVO theory. Surface and interphase phenomena: tension, curve, extension, adhesion, thermodynamics, physical and chemical analysis. Solutions. Colloids: molecular, association. Crude dispersions: emulsions, suspension. Microemulsions and nanoemulsions. Stability of disperse systems; production; testing; solubility; HLB parameter; forms of instability. Foams; anti-foaming agents. Aerosols. Friction; lubrication.

20. Individual Project Work (17 ECTS credits)

Independent professional research work concluded by thesis. Each student selects a topic and a supervising faculty member. Definition of the scientific – professional question, theoretical foundations, approaches, methodology, research guidelines and particularities. Overview and use of available bibliography data. Methods and experimental techniques. Independent experimental work with recording. Analysis of results, making partial decisions and their testing. Written submission of the scientific work. Research as a creative and interdisciplinary teamwork.

21. Thesis Defence (5 ECTS credits):

Preparation of the thesis with elements of a scientific article: title, contents, summary, list of abbreviations, introduction, aim of the study with a working hypothesis, materials and methods, results, discussion, conclusions, bibliography. Oral presentation of the thesis content supported by a computer projection. Degree examination: testing the student's ability to synthesize knowledge of a broader research area.

22. Toxicology of Cosmetic Ingredients (5 ECTS credits):

Adverse effects of cosmetic product ingredients: specific and non-specific adverse effects. Toxicity of ingredients of cosmetic products for hair care, nail make-up, perfuming, deodorising, depilation, skin whitening and tanning with or without sun, powdering, making up and removing make-up. Health and environment protection during production and after product application; handling of waste cosmetic products and their ingredients.

23. Nutritional Supplements (5 ECTS credits):

Legislation in the area of nutritional supplements. Definitions of basic terms: nutraceuticals, functional food, diet food. Recommended daily intake of nutrients. Vitamins. Vitaminoids. Minerals. Amino acids. Lipids. Carbohydrates. Prebiotics and probiotics. Antioxidants. Bee products. Enzymes. Phytoestrogens, phytosterols.

24. Skin and Metabolic Disorders (5 ECTS credits)

Lesions on skin and other surface tissues. Disorders of metabolism and transport of amino acids, carbohydrates, proteins, mucopolysaccharides, oligosaccharides, nucleotides, lipoproteins, steroids, haem, bilirubin and bile acids, DNA correction mechanisms, trace elements, vitamins.

25. Reactive Intermediates in the Skin and Antioxidants (5 ECTS credits)

Skin radicals: formation; chemical, physical, physiological and toxic properties; photodynamic effects, phototoxic compounds. Reactive oxygen and nitrogen intermediates in the skin, radical reactions, lipid peroxidation, oxidative damages of skin constituents. Oxidative stress,

physiological oxidants in the skin. Antioxidants in cosmetic products: types, mechanisms of action, applicability.

26. Cellular and Tissue Cultures (5 ECTS credits)

Cellular cultures, types. Cultivation of cells and tissues in cultures: approaches, equipment, requirements at work; isolation, selection, maintenance and transformation of cells. Quantification and characterisation of cells: level of differentiation, reproductive performance; cytotoxicity, genotoxicity. In vitro skin models: researches and testing of cosmetic products. Legislation and standardization.

27. Physiology (5 ECTS credits)

Physiological principles: homeostasis, transport phenomena, membrane potential, skeletal and smooth muscle. Blood circulation: heart, circulatory system, microcirculation, flow through skin. Respiration: ventilation, diffusion, pulmonary blood circulation, gas transport in the blood. Kidneys: electrolyte and water trafficking in the body, kidney function test. Nervous system physiology: synaptic transfer, somatosensory system, physiology of pain, sight, hearing, vegetative nervous system, integrative functions of the brain stem, brain hemisphere specialization. Digestion: composition and function of the digestive tract, secretion of saliva, juices and bile. Endocrinology: secretion of hormones, adeno- and neurohypophysis hormones, thyroid hormones, adrenal hormones and sex hormones. Metabolism: transformations of substances and energy in the body, regulation of blood glucose concentration, regulation of body temperature; the role of the skin, perspiration.

28. Field-Specific English (5 ECTS credits)

Introduction to professional and technical text discourse, use of dictionaries and other sources of information, reading and translation of cosmetology related professional texts, technical language specifics, writing of articles and reports, procedure/process descriptions, pronunciation of technical terms, business communication, taking part in discussions, presentations in English language.

29. Microbiology (5 ECTS credits)

Structure of bacterial cells, fungi, viruses and parasites; genetics of microorganisms; pathogenesis of infection. Immunology and microbiological diagnostic procedures; epidemiologic properties of microorganisms and infections. Pathogenic bacteria: mechanisms of pathogenicity, proving and treatment of infections, bacterial resistance against antibiotics. Pathogenic viruses: occurrence, proving and treatment of infections, viral resistance. Pathogenic fungi: mechanisms of pathogenicity, proving and treatment of fungal infections. Pathogenic parasites: mechanisms of pathogenicity, proving and treatment of infections. Microorganisms of significance in cosmetology: routes of infection and prevention.

30. Cosmetics in Sports (5 ECTS credits)

Medico-athletic aspects of cosmetics in sport; hygiene, care, prevention. Nutrition, nutritional supplements and illegal substances; their effect on the skin. Special features of cosmetics in sports: cosmetics for certain kinds of sports and climatic conditions; cosmetics for professional and recreational athletes; cosmetics for aerobic and anaerobic sports. Revitalizing and relaxing performance of cosmetic products; skin receptors, ingredients, cosmetic product performance and safety.