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It is brought to your kind notice that information which is below could be changed according to unforeseen circumstances.

## AUTUMN SEMESTER SUBJECTS

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**Entitlement** Agricultural Market and Trade in Agricultural Products, 5 cr.

### Prerequisites

Horticulture, Farm Animal Nutrition and Fodder Accounting, Agricultural Product Quality, Storage and Processing Simulations, Basics of Economics, Marketing and Market Research

### Main aim

Provide knowledge about the price mechanism on the agricultural market and peculiarities of the food market, as well as develop skills to identify the effect of the supply and demand on the agricultural market.

### Summary

While studying the subject students analyse agricultural demand and supply, price formation, and agricultural protectionism, discuss the domestic and international trade theory, analyse the international trade policy and its impact on the development of domestic agricultural and food trade. Students get acquainted with the information necessary to start and successfully carry out domestic and international trade: contracts, trade finance, trade risks, settlements, etc.

### Learning Outcomes

1. Will carry out agricultural supply and demand analysis.
2. Will define trade preconditions and manage the sale - purchase processes.
3. Will conclude the production cost in agriculture.
4. Will describe and evaluate the agricultural protectionism.
5. Will evaluate the impact of international trade policy on the development of agricultural and food trade.
6. Will organize international trade processes, conclude international sale - purchase contracts, and follow international trade (contract).
7. Will plan and manage import and export operations, and be aware of the customs procedures in the context of trade with third countries.

### Syllabus

Analysis of the demand for agricultural products: the demand for agricultural products in the world, demand factors. Agricultural products supply Analysis of supply factors, income differences in agriculture.

Trade preconditions. Purchase and sales process management.

Price formation in agriculture: agribusiness structure, market forms and competition, vertical integration and price formation system.

Agricultural protectionism: agricultural market policy analysis.

International trade processes. International sale - purchase contracts. International trade (contract) terms Incoterms.

The meaning and processes of logistics in trade.

International trade financing, short-term and long-term trade financing.

### Evaluation procedure of knowledge and abilities

Study subject outcomes are assessed by the criterion and cumulative assessment. For the purpose of the cumulative assessment of learning outcomes there are applied intermediate settlements. Subject studies are completed with an examination. Certain learning outcomes foreseen by the syllabus are assessed by cumulative assessment of the components.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

**STUDY SUBJECT/MODULE PROGRAMME (SSMP)**

**AGRIBUSINESS TECHNOLOGIES**

**Entitlement** Basics of Economics, Marketing and Market Research, 6 cr.

### **Prerequisites**

B1 level of English language

### **Main aim**

To provide knowledge and skills required to evaluate good economic practice and principled economic model indicators. To provide knowledge on how the problems of agricultural or alternative business management can be solved using modern marketing theories and how the challenges of future farm business management and their solutions can be predicted on the basis of these theories. To provide knowledge and skills that would allow to plan and independently conduct market research and to make decisions in the production and sale of agricultural products based on the results of this research.

### **Summary**

The aim of the subject is to introduce theories and research methods of macro and micro-economics, provide sufficient knowledge necessary for the analysis of social and economic processes. Students apply microeconomic methodological principles, define possibilities for meeting the needs in the context of limited resources, and address the problem of choice in different economic systems. While studying the module students also apply macroeconomic methodological principles, examine the dynamics of the national product, evaluate the state and every citizen's socio-economic well-being, study the influence of the shadow economy on the national economy, identify and analyse main macroeconomic indicators, familiarise with the strategic and operational marketing, learn to apply marketing and market research principles and methods analysing and solving agricultural production and marketing problems.

### **Learning Outcomes**

1. Will explain, based on the principles of economics, the connections and regularities of economic phenomena, the importance of the circular economy for the country's economy and public welfare, evaluate innovative solutions to systemic social, environmental and wider economic welfare problems.
2. It will be based on theoretical economic models and economic calculations, will solve relevant issues of economic activity and will substantiate the decisions made or projects prepared.
3. Will explain and evaluate economic processes at the micro and macro level, their potential challenges and social consequences.
4. Will analyze socio-economic problems at the organizational level and propose solutions.

5. Will independently conduct market research to substantiate the relevance and feasibility of the raised entrepreneurial idea and make decisions on the implementation of the idea.
6. Will evaluate the suitability of quantitative and qualitative research methods for the specific analysis of the agricultural business management situation and on this basis will generate knowledge of consumer and customer behavior.
7. Will define the elements of the marketing complex and establish the relationship between their coordination.
8. Will prepare a market research plan and implement it.

### Syllabus

Introduction to economics: economic environment and its development tendencies in Lithuania and in the world. Principles of the circular economy and good practice. Sustainable economic development.

Methodological bases of microeconomics: market, supply and demand analysis, production theory, company behavior.

Methodological bases of macroeconomics: theory of economic growth, unemployment, inflation, cycles of economic activity.

The importance and content of marketing.

Market segmentation and consumer behavior.

Marketing complex.

Significance and types of market research.

Planning and implementation of market research.

Data analysis.

### Evaluation procedure of knowledge and abilities

Study subject outcomes are assessed by the criterion and cumulative assessment. For the purpose of the cumulative assessment of learning outcomes there are applied intermediate settlements. Subject studies are completed with the project defence/evaluation. Certain learning outcomes foreseen by the syllabus are assessed by cumulative assessment of the components.



## VILNIUS UNIVERSITY OF APPLIED SCIENCES

### STUDY SUBJECT/MODULE PROGRAMME (SSMP)

### CHEMICAL ANALYSIS

**Entitlement** Methods of Biochemical Analysis, 6 cr.

### Prerequisites

B1 level of English language

### Main aim

Provide students with the knowledge of modern methods used in biochemical analysis and develop skills to apply the gained knowledge in practice.

### Summary

The aim of the subject is to acquaint students with the most important bioorganic compounds used in biotechnology, master modern methods of protein and nucleic acid analysis and application, analyse qualitative and quantitative parameters and detection methods of molecular

biology reagents, form skills to apply basic methods used in biotechnology laboratory: electrophoresis of protein and nucleic acid and their concentration assessment.

### Learning Outcomes

1. Be able to analyse and systematise the subject specific information, publicly present it and take responsibility for the results
2. Be able to apply analysis methods of nucleic acids and protein in a dynamic practical activity and critically evaluate the findings
3. Be able to analyse and assimilate new genomics methods, select and apply the method corresponding to the objective of the analysis
4. Be able to assess findings of biochemical analysis methods, reliability and understand their meaning
5. Be able to discuss the importance of the quality of biochemical analysis results on the organisation and society
6. Be able to characterise nucleic acid exchange reactions carried out by enzymes and analyse the product of the reaction
7. Be able to evaluate the effect of chemical materials and physical parameters on the efficiency of enzymatic reactions
8. Be able to select and use reagents, solutions and equipment for biochemical analysis
9. Be able to analyse the importance of material, reagent, equipment and the method parameters on results of the biochemical analysis
10. Be able to prepare nucleic acid and protein samples for biochemical analysis
11. Be able to evaluate properties of DNA, RNA, protein and other biological materials and their importance for sample preparation and the analysis
12. Be able to evaluate the parameters of quantitative and qualitative methods, select analysis conditions to obtain reliable results
13. Be able to carry out qualitative and quantitative analysis to determine nucleic acid and protein
14. Be able to perform a nucleic acid and protein biochemical analysis
15. using specific laboratory apparatus and methods
16. Be able to organise, analyse and describe analysis data using statistical methods and principles of good documentation practice
17. Be able to analyse the quality parameters of molecular biology reagents and methods
18. Be able to evaluate the application of biotechnology products and methods, their operation and importance for biotechnology

### Syllabus

1. Work in a laboratory, Preparation and storage of vessels and solutions.
2. Statistical methods for experiment planning and result analysis.
3. Working with automatic pipettes.
4. Buffer solutions and their preparation.
5. Spectroscopic analysis, fluorescence in biochemical analysis.
6. Protein, enzymes, methods to determine their concentration. Methods of protein analysis.
7. Preparation of polyacrylamide gels for protein analysis.
8. Protein electrophoresis.
9. Defection of protein in gels and having transferred onto the membrane .
10. Nucleic acids, purification methods, determination of RNA and DNA concentration.
11. Peculiarities of working with RNA.
12. Nucleic acid electrophoresis and detection in gels
13. Manipulation of DNA: restriction endonucleases, ligation
14. Methods of immunochemical analysis

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| 15. Polymerase chain reaction                                     |
| 16. Quantitative PCR and other nucleic acid amplification methods |
| 17. The use of radioisotope in analysis                           |
| 18. Methods of nucleic acids labelling                            |
| 19. DNA sequencing. Classical and modern methods.                 |

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, Practical classes/laboratory work, self-study, examination)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**CHEMICAL ANALYSIS**

**Entitlement** Extraction and Purification of Bioproducts, 6 cr.

### Prerequisites

B1 level of English language

### Main aim

Provide students with the knowledge and skills of the detection and purification of bioproducts, expand chemical analysis specialist's skills and develop biomanufacturing competences.

### Summary

The aim of the subject is to acquaint students with the sources of bioproducts, their characteristics and application, analyse quality requirements for bioproducts and the requirements for water used in bioproduction. Students study extraction methods of endo-, exoproducts and nucleic acid, application of chromatographic purification method, develop practical chromatographic purification skills, familiarise with the used equipment operating principles and opportunities, analyse exceptional requirements set for working in a controlled environment, as well as bioproduct storage and transportation conditions.

### Learning Outcomes

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| 1. Be able to examine properties and sources of bioproducts  |
| 2. Be able to analyse areas of bioproduct application and the set quality requirements   |
| 3. Be able to explain the operating principles and opportunities of the equipment used in bioproduct extraction and purification                             |
| 4. Be able to compare the expediency of methods used for protein and nucleic acid extraction and purification  |
| 5. Be able to compare methods used for exoproduct purification and endoproduct extraction  |
| 6. Be able to explain exceptional requirements set for working in a controlled environment   |
| 7. Be able to operate safely the equipment used in bioproduct extraction and purification  |
| 8. Be able to characterise the requirements for water used in the production of bioproducts  |
| 9. Be able to compare the properties of solutions used in the production of bioproducts  |
| 10. Be able to apply the knowledge of the effect of the target product immunochemical properties on its qualitative and quantitative analysis and separation |

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| 11. Be able to discuss quality and quantity requirements set for preparations             |
| 12. Be able to describe the stages of bioproduct purification process                     |
| 13. Be able to evaluate the application of chromatographic purification method            |
| 14. Be able to define conditions needed for the storage and transportation of bioproducts |
| 15. Be able to analyse areas of bioproduct application and the set quality requirements   |

### Syllabus

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| 1. Bioproducts: sources and application                        |
| 2. The process of purification                                 |
| 3. Purification of water for biotechnological purposes         |
| 4. Preparation of solutions for the production of bioproducts  |
| 5. Purification of exoproducts                                 |
| 6. Extraction of endoproducts                                  |
| 7. Cell disassembly by the nucleic acid producents             |
| 8. Sedimentation and centrifugation                            |
| 9. Fractionation of bioproducts                                |
| 10. Tangential filtration                                      |
| 11. Basics of bioproduct chromatography                        |
| 12. Stationary phases used for the purification of bioproducts |
| 13. Chromatographic methods                                    |
| 14. Methods of chromatographic division                        |
| 15. Chromatographic equipment                                  |
| 16. Bioproduct preparations                                    |
| 17. Production facilities and procedures                       |

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, Practical classes/laboratory work, self-study, examination)
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**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**CHEMICAL ANALYSIS**

**Entitlement** Physical Chemistry, 6 cr.

### Prerequisites

B1 level of English language
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### Main aim

Provide students with the knowledge of physical phenomena and general laws of chemical processes necessary to manage chemical processes and analyse the properties of solutions. Students get acquainted with chemical kinetics and catalysis, develop the ability to understand electrical and chemical energy transformation, familiarise with the classification and analysis of disperse systems.
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### Summary

The aim of the course is to acquaint students with differences between ideal and real gases, application of the ideal gas equation for real gas, gas liquefaction, gas mixtures, physical properties of liquids and crystalline state. Students learn the fundamentals of thermodynamics, basic laws and findings of thermochemistry, develop the ability to perform thermochemistry calculations, apply phase rule equation for single-component and two-component systems, make phase diagrams, analyse physical properties of solid materials in solution liquids, liquid solutions in liquids and gas solutions in liquids. The subject provides students with the knowledge of chemical equilibrium, equilibrium shifts, chemical affinity of substances, influence of various factors on the speed of chemical analysis, classification of reactions and the molecular activation theory. Students will also analyse surface phenomena, application of catalytic processes in modern technology, study the electrolysis, electric conductivity of solutions and practical application, galvanic cells, learn to classify disperse systems, make and analyse microheterogeneous systems, and apply them practically

### Learning Outcomes

1. Be able to find and analyse scientific literature independently, summarise and systematise information
2. Be able to conclude a bibliographic list on a specific topic in compliance with the international standards
3. Be able to analyse various situations / cases, make logical conclusions and reason them
4. Be able to solve physical chemistry tasks
5. Be able to prepare and present a presentation on a physical chemistry draw conclusions, argue and discuss
6. Be able to classify substances according to typical characteristics of physical states and apply the basic laws of physical states
7. Be able to describe phenomena occurring in phase transition boundaries, explain the homogeneous and heterogeneous catalysis
8. Be able to explain the electrical conductivity of solutions and electrolysis
9. Be able to classify dispersion systems and recognise them in the surrounding environment
10. Be able to explain properties of macromolecular compounds, gels and processes of the formation and aging of gel-like substances
11. Be able to recognise the basic concepts of chemical thermodynamics, apply the basic law of thermochemistry and its conclusions, provide conditions for the right direction of a chemical process
12. Be able to classify reactions according to various characteristics, express the speed of chemical reactions and explain their mechanism
13. Be able to model chemical energy conversion to electricity, calculate the electrode potential in galvanic cells
14. Be able to analyse phase equilibrium systems applying phase rule equation and use the thermal analysis method to examine alloys
15. Be able to analyse colligative properties of solutions and solutions of solid, liquid and gaseous substances in liquids
16. Be able to produce and examine dispersive systems

### Syllabus

1. Physical states of matter
2. Fundamentals of chemical thermodynamics
3. Phase equilibrium and solutions
4. Chemical equilibrium, kinetics and catalysis
5. Electrochemistry

## 6. Fundamentals of colloid chemistry

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, Practical classes/laboratory work, self-study, examination)



VILNIAUS  
KOLEGIJA

**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**CHEMICAL ANALYSIS**

**Entitlement** Training practice of chemical analysis quality, 3 cr.

### Prerequisites

B1 level of English language, Quality of Chemical Analysis, Analytical Chemistry, Organic Chemistry, Spectral Analysis, Electrochemical Analysis, Chromatographic Analysis, Laboratory Activity

### Main aim

To deepen the chemistry specialist skills in the diversity of chemical analysis methods and develop practical skills necessary to determine the characteristics of method verification.

### Summary

In the laboratory students carry out chemical analysis measurements to determine the characteristics of method verification: limit of detection and limit of quantification, trueness, precision and expanded uncertainty; examine control and blank samples; construct the calibration curve (for spectrophotometric analysis methods), make control charts, and evaluate the obtained results by statistical methods.

### Learning Outcomes

1. Be able to expand knowledge of the selection and verification of a chemical analysis method
2. Be able to evaluate chemical analysis methods in the laboratory
3. Be able to independently determine the characteristics of the method verification according to the requirements
4. Be able to verify the method correctly with reference to the validation results
5. Be able to explain the operating principles and application possibilities of the laboratory equipment and devices used for chemical analysis
6. Be able to perform measurements in accordance with the laboratory safety requirements
7. Be able to deepen practical skills using the chemical analysis laboratory equipment and devices to carry out the method verification
8. Be able to perform measurements in chemical analysis and ensure reliable test quality management
9. Be able to develop a method verification report and decide on its application
10. Be able to provide practical evaluation of various experimental measurements

11. Be able to use statistical parameters and criteria for the processing of chemical analysis data

12. Be able to evaluate the parameters of chemical analysis method verification according to statistical criteria

### Syllabus

1. Testing of the primary reference material for the conclusion of a calibration curve

2. Evaluation of limit of detection and limit of quantification of the chemical analysis method

3. Control sample test and the conclusion of control charts

4. Evaluation of the trueness and precision of the chemical analysis method

5. Determination of the expanded uncertainty of the method

### Evaluation procedure of knowledge and abilities

Cumulative assessment (Laboratory work, Self-study assignment, Final test)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**FOOD TECHNOLOGY**

### Entitlement

Non Animal Origin Food Products Technology, 10 cr.

### Prerequisites

B1 level of English language, Nutrition and Food Chemistry, Chemistry, Basics of Exact Sciences.

### Main aim

Provide students with the knowledge of foodstuffs technologies to develop students' ability to master different foodstuffs production technologies, to analyse the quality of raw materials and products, composition of products, to familiarize students with food safety, sanitary and hygiene requirements.

### Summary

While studying the module students get acquainted with the chemical composition of foodstuff, foodstuffs safety, sanitary and hygiene requirements, analyse foodstuffs technologies and quality of raw materials.

### Learning Outcomes

1. Be able to choose safe raw materials of high quality for different food stuffs production

2. Be able to calculate raw and other materials quantities according to production volume, output and to prepare food stuffs production technological instructions.

3. Be able to describe technological processes, their parameters, evaluate their advantages and disadvantages; create, implement modern technologies.

4. Be able to indicate main and additional food industry raw materials, their composition and features; to analyze main groups of food additives and their functional features; to apply production standards, normative acts in food stuffs production; indicate storing conditions and expiry dates of raw and other materials, readymade production; to apply normative documentation requirements for food stuffs production.

5. Be able to evaluate if the raw materials match the requirements of standards and normative acts; to explain quality control methods applied in production and waste; to evaluate production risk factors and set main management aspects.

### Syllabus

International typology and classification, quality assessment methods, labelling and storage for the products, as a quality objects.

Grain processing equipment, technology of bread products.

Confectionary manufacturing technology and equipment.

Fruit and vegetables processing technology and equipment

Starch, starch-syrup production technology.

Sugar production technology and equipment.

Technology of fermentation.

### Evaluation procedure of knowledge and abilities

Portfolio with integrated tasks to acquire knowledge and skills, Laboratory/practical work, Written test Examination. Criterion and cumulative evaluations are being applied.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**VETERINARY**

**Entitlement** Animal Anatomy, 13 cr.

### Prerequisites

B1 level of English language

### Main aim

To provide knowledge of anatomy / morphology about the structure and position of animal cells, tissues, organism, organ systems and individual organs in the body, necessary for the professional training of a veterinary assistants / nurses.

### Summary

The subject of animal anatomy begins with the learning of anatomical terms in Latin and the study of the anatomical structure of animals, starting with the cell, tissues, organs, their systems and ending with the whole organism. Students will practically observe cells and tissues under a microscope, learning the benefits of biologicals, animal skeletons, models, visual and IT didactic tools.

## Learning Outcomes

1. Will be able to demonstrate knowledge in Latin and Lithuanian about the anatomical and morphological structure of various animals, describe the similarities and differences in the structure of cells, tissues, organs and organ systems.
2. Will know the location of individual animal tissues, organs or organ systems in pets and farm animals and will be able to apply and use this knowledge in further studies and veterinary practice.

## Syllabus

1. Origin, history and significance of Latin in veterinary studies. Latin alphabet and basic rules of pronunciation and writing of words.
2. Latin terminology in the study of cytology, histology, embryology, anatomy and its correct use.
3. Cytology, histology and embryology. Animal organism, organs and organ systems.
4. Osteology and syndesmology. Myology. Anatomy of the skin and its derivatives.
5. Anatomy of blood, lymph and their circulation, respiratory and digestive organs.
6. Anatomical structure and topography of the urinary and reproductive organs, endocrine glands.
7. Anatomy of the nervous system and sensory organs. Peculiarities of anatomical structure of birds.

## Evaluation procedure of knowledge and abilities

The studies of the subject (module) are completed with an exam or the defense / assessment of the project (independent work) completed by the student. The final assessment of the subject (module) consists of the sum of the interim assessments and exam (independent work (project)) assessments received during the whole semester, multiplied by the respective weighting coefficients assigned to them.



**Entitlement** Epidemiology, 5 cr.

## Prerequisites

B1 level of English language

## Main aim

To provide knowledge about microorganisms and parasites, their infectious animal diseases, in order to develop the student's ability to assess the clinical condition of the animals.

## Summary

The morphology, physiology and prevalence of microorganisms in nature and infectious diseases caused by them are reviewed. Methods of diagnosing these diseases and prophylactic-

anti-epizootic measures are shown. Knowledge and skills necessary for the differentiation and identification of these diseases and the use of pre-epizootic measures are developed.

### Learning Outcomes

1. Will be able to take a sample for laboratory tests.

### Syllabus

1. Basics, objects, methods and tasks of veterinary epizootiology. Science of infection (sources of infection, modes of infection, forms of manifestation, course, types). Methods, significance and benefits of vaccination of animals and birds. Disinfection, deratization and disinsection.

2. Admission of animals with infectious diseases to the clinic. Stationary.

3. Sampling for testing. Laboratory blood, urine, etc. sample testing technique. Methods of processing and safe disposal of animal carcasses.

4. Infectious diseases of animals and birds and methods of their diagnosis. Invasive diseases common to several animal species and humans.

### Evaluation procedure of knowledge and abilities

The studies of the subject (module) are completed with an exam or the defense / assessment of the project (independent work) completed by the student. The final assessment of the subject (module) consists of the sum of the interim assessments and exam (independent work (project)) assessments received during the whole semester, multiplied by the respective weighting coefficients assigned to them.



**Entitlement** Applied dendrology, 5 cr.

### Prerequisites

B2 level of English language

**Main aim** To give knowledge about the plant nomenclature and taxonomy, the main principles of grouping of woody ornamental plants, the main representatives of ornamental groups, their use in landscaping. Developing of plant identification abilities.

**Summary** Morphological and systematic background knowledge is provided as well as knowledge about the most common genera of gymnosperms and woody angiosperms grown and growing in Lithuania, their species and cultivars. Introduction in to the possibilities of using woody ornamental plants in landscaping. Developing of plant identification abilities.

### Learning Outcomes

1. Be able to explain and analyze the main terms and concepts of dendrology. Be able to provide aggregated information.
2. To know the genera of woody ornamental plants grown in Lithuania, their characteristics, variety and possibilities of use in landscaping. To be able to independently select and apply appropriate representatives of various woody ornamental plants in landscaping.
3. To be able to characterize (recognize) the genera of most common woody plants cultivated in Lithuania.

### Syllabus

1. Plant Nomenclature and Taxonomy. Basics of Plant Morphology.
2. Ornamental features of woody plants
3. Gymnosperms, their species and cultivars and use in landscaping
4. Woody angiosperms, their species and cultivars and their use and maintenance in landscaping

### Evaluation procedure of knowledge and abilities

Subject studies are completed with an examination.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**LANDSCAPE DESIGN**

**Entitlement** Landscape architecture-2, 8 cr.

### Prerequisites

B2 level of English language

**Main aim** - Develop of the ability to prepare landscaping project by providing knowledge and practical experience.

**Summary** - in providing knowledge, the composition of form, volumetric composition, design of paths, roofing and vertical planting, legal acts regulating the design of greenery are analysed. Skills of landscape design project preparation are developed.

### Learning Outcomes

4. To be able to prepare a landscape design project

### Syllabus

1. Form and spatial composition
2. Greenery composition, greenery design solutions and alternatives
- 3 Street greenery, path design

4. Roof gardens, vertical planting
5. Legislation regulating the design of green areas

#### Evaluation procedure of knowledge and abilities

Cumulative assessment (practical tasks, defending project, independent work)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**LANDSCAPE DESIGN**

#### Entitlement Professional Foreign Language, 5 cr.

##### Prerequisites

B2 level of English language

**Main aim** - develop the ability to use a foreign language as a tool of communication and collaboration in a professional environment. Develop ESP communication skills necessary for a landscape designer.

**Summary** - during the foreign language course students study the following topics: Studies, work and career. The role of plants in human life. The art of gardening. The concept of design. Landscape design. Improving the communication and presentation skills.

##### Learning Outcomes

Will be able to communicate on professional topics in a foreign language and apply a formed and correct professional vocabulary in the work environment.

##### Syllabus

1. Studies, work and career
2. The role of plants in human life
3. Building English language learner's professional vocabulary: The art of gardening. Basic gardening tools. Plant care, pruning, grafting.
4. The concept of design. Landscape design: what is it? Case study and creative task.
5. Introduction to the vocabulary of environmental engineering: key concepts used in the fields of environmental engineering and landscape architecture.

#### Evaluation procedure of knowledge and abilities

Cumulative assessment (practical tasks, independent work, exam)

**Entitlement** Agribusiness Management, 8 cr.

### Prerequisites

Basics of Communication; Applied Mathematics and Informatics

### Main aim

To provide business management knowledge required for successful management of agribusiness.

### Summary

Various forms (including agriculture) of business management theory based on sustainable development strategy are identified. Management indicators are analysed, production of agribusiness enterprises is planned, marketing is organized, risks and optimal decisions are made, changes and innovations are managed, and quality management, social responsibility are evaluated. The concept and content of personnel management, processes of personnel policy formation and implementation are reviewed. The importance of personnel planning, work organization and payment, employee motivation and job satisfaction, equal opportunities and diversity management in agribusiness enterprises is analysed. The importance of leadership and teamwork is revealed, and the possibilities of stress and conflict management are demonstrated. Introduction to the project concept, features and their classification, project management content, methods are identified.

### Learning Outcomes

1. Will be able to know and comprehend the paradigms of contemporary agribusiness enterprises and management science, examples of their practical application.
2. Will be able to plan production in agribusiness and develop effective marketing strategy.
3. Will be able to manage change and innovation in agribusiness enterprises; will be able to evaluate quality management and social responsibility in agribusiness.
4. Will be able to apply effective personnel policies (recruitment, motivation, and training).
5. Will be able to choose and evaluate project idea, identify project risks, prepare risk management plan.
6. Will be able to understand the history of leadership and current leadership theories and how leadership models are put into practice.
7. Will be able to analyse and assess business risks and make optimal decisions in agribusiness.

### Syllabus

1. Principles of Management and Agribusiness.
2. Production Management, Planning and Control. Principles of Marketing in Agribusiness.
3. Personnel Management in Agribusiness.
4. Introduction to Project Management. Project Features and Classification.

5. Project Management Methods.
6. Management and Leadership. Teams. Effective Teamwork
7. Risk management in Agribusiness.

### Evaluation procedure of knowledge and abilities

Study subject outcomes are assessed by the criterion and cumulative assessment. For the purpose of the cumulative assessment of learning outcomes there are applied intermediate settlements. Subject studies are completed with an examination. Certain learning outcomes foreseen by the syllabus are assessed by cumulative assessment of the components.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIUS  
KOLEGIJA

**AGRIBUSINESS TECHNOLOGIES**

**Entitlement** Basics of Communication, 4 cr.

### Prerequisites

B1 level of English language

### Main aim

To provide the knowledge and skills needed to develop purposeful competence in language, rhetorical, communication, effectively applying the principles of negotiation and management in practice.

### Summary

The aim of the subject is to overview the background and importance of communication science, characteristics of perception schemes, operating principles of attitudes, values and expectations. Students discuss practical aspects, forms and tools of communication, learn to analyse communications factors in business companies, principles of negotiation and corporate image formation, practically apply the principles of communication and cooperation, learn to form teams, organise and conduct negotiations, resolve conflicts.

### Learning Outcomes

1. Will plan the process of communication with the client based on the theory of communication and social perception.
2. Will apply in practice the principles of harmonious verbal, non-verbal and written communication in the context of negotiations.
3. Will apply the regularities of conflict development and find appropriate solutions to them in conflict situations.
4. Will select a negotiation strategy and manage the negotiation process.
5. Will analyze and evaluate the negotiation process.

### Syllabus

The essence and goals of communication. Communication process. Assertiveness.

Social perception in communication.
Communication channels: verbal (verbal) and non-verbal (non-verbal) communication.
Sustainable business communication. Communication of change and crisis.
Conflict management and prevention.
Negotiating with customers and suppliers.
Persuasive public speaking.

### Evaluation procedure of knowledge and abilities

Study subject outcomes are assessed by the criterion and cumulative assessment. For the purpose of the cumulative assessment of learning outcomes there are applied intermediate settlements. Subject studies are completed with an examination. Certain learning outcomes foreseen by the syllabus are assessed by cumulative assessment of the components.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**AGRIBUSINESS TECHNOLOGIES**

**Entitlement** Horticulture and Animal Husbandry Production Economy, 5 cr.

### Prerequisites

Basic of economic

### Main aim

To provide knowledge and skills required to apply theoretical knowledge of justification, evaluation and management of crop and livestock production in practice, to assess technical and economic interdependence of factors, to economically justify product production by estimating costs, profits, product supply and factor demand.

### Summary

The aim of the subject is to introduce crop and livestock production processes and agricultural production conditions, as well as investment calculation and reasoning methods. Students analyse economic aspects of production and profit maximisation models, learn to apply economic evaluation models of crop and livestock production methods, evaluate manufacturing productivity and efficiency, familiarize with the optimization of crop and livestock production structure.

### Learning Outcomes

1. Will be able to assess the agricultural environment and production conditions.
2. Will be able to independently perform calculations that allow solving the issues of optimization of crop and livestock production activities and justify the decisions made.
3. Will be able to optimize the production structure of crop and livestock production by assessing the optimal use of economic factors of production.

4. Will be able to independently perform calculations that allow to compare and evaluate the cost and profit optimization models of crop and livestock production.

5. Will ability to calculate, analyze and evaluate the indicators that determine the results of production and sales of crop and livestock products.

### Syllabus

Agribusiness economic environment in Lithuania. Production of crop and livestock products processes, production conditions.

Fixed assets of an agribusiness entity.

Current assets of an agribusiness entity.

Labor resources and costs, their optimal use.

Calculation of costs and costs in crop production and in animal husbandry.

Crop and livestock production optimization of production activities.

Optimization of crop and livestock production activities.

### Evaluation procedure of knowledge and abilities

Study subject outcomes are assessed by the criterion and cumulative assessment. For the purpose of the cumulative assessment of learning outcomes there are applied intermediate settlements. Subject studies are completed with the project defence/evaluation. Certain learning outcomes foreseen by the syllabus are assessed by cumulative assessment of the components.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**CHEMICAL ANALYSIS**

**Entitlement** Biochemistry, 3 cr.

### Prerequisites

B1 level of English language

### Main aim

Provide students with the knowledge and skills necessary to apply general regularities of chemistry and describe the composition, properties and changes of substances constituting living organisms, form researcher skills, collect information about the composition of living systems and operating principles, and develop professional competences of a qualified chemistry specialist.

### Summary

The subject aims to introduce students to the object of biochemistry, research areas and objectives. Students study the role of water in biological systems, energy of living systems, the structure and biological function of nucleic acid, analyse the structure and biological function of protein, familiarise with protein biosynthesis in the cell, specific protein functions, classification of enzymes, discuss kinetics of enzymatic reactions, define enzymes modifying nucleic acids,

become acquainted with the structure, distribution and function of hydrocarbons as well as the structure and functions of lipids.

### Learning Outcomes

5. Be able to demonstrate the knowledge of new facts, concepts and theories
6. Be able to apply the acquired knowledge and experience in explaining the phenomena occurring in nature
7. Be able to describe the object, concepts and general patterns of biochemistry, create a compound name using the IUPAC nomenclature system
8. Be able to describe the composition and structure of main biological polymers synthesized in the body
9. Be able to identify bioorganic compounds which are functionally important for living organisms
10. Be able to apply theoretical biochemical knowledge for the validation of analysis methods
11. Be able to define functions of biologically active polymers
12. Be able to explain operating mechanisms of biologically active compounds
13. Be able to describe properties of bioorganic compounds which determine fractionation and separation possibilities

### Syllabus

1. The object of biochemistry, research areas and objectives. Water in biological systems. Energy of living systems
2. The structure and biological function of nucleic acid
3. The structure and biological function of protein
4. Specific functions of protein
5. Classification of enzymes. Kinetics of enzymatic reactions
6. Enzymes modifying nucleic acids
7. The structure, distribution and function of hydrocarbons. Lipids: composition and functions

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, laboratory work, self-study, examination)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**CHEMICAL ANALYSIS**

**Entitlement** Microbiology, 3 cr.

### Prerequisites

B1 level of English language

### Main aim

Develop the microbiology knowledge system and skills necessary to work with microorganisms.

### Summary

While studying the subject students examine the objects, aims and objectives of microbiology, get acquainted with microorganism cell structure, physical, chemical and biological factors on microorganisms, their physiology and systematics of microorganisms. Students are introduced to the microscopic structure, working principle of the microscope, microscopic preparations, develop initial microscope skills, get acquainted with microorganism cultivation principles, learn to prepare the nutrient media and develop microorganism quantitative determination skills, study sterilisation and disinfection principles, as well as microorganism preservation and storage techniques.

### Learning Outcomes

1. Be able to carry out microbiological tests independently and in collaboration with colleagues
2. Be able to explain and summarise test results independently
3. Be able to explain the importance of microorganisms for biotechnological processes
4. Be able to explain the basic concepts of microbiology and characterise microorganism grouping principles
1. Be able to describe the most important characteristics of the structure and physiology of microorganisms
2. Be able to describe the effect of fundamental environmental factors on microorganisms
3. Be able to explain the key metabolic processes occurring in cells of microorganisms
4. Be able to use standard equipment for the cultivation and analysis of microorganisms
5. Be able to apply methods to *determine* the *number* of *microorganisms*
6. Be able to work with a light microscope, use a variety of microscopy methods
7. Be able to apply microorganism cultivation techniques, media preparation, media and work equipment sterilisation methods in practice
8. Be able to work with pure microorganism cultures under aseptic conditions
9. Be able to define the principles of sterilisation and disinfection
10. Be able to prepare and analyse microorganism samples
11. Be able to cultivate microorganisms

### Syllabus

1. The object, aims and objectives of microbiology, historical development. Links of the microbiology science with other bio-sciences (biochemistry, genetics, molecular biology)
2. Structure of the cell: prokaryote and eukaryote cells. Bacterial morphology
3. Diversity and characteristics of archaea. Viruses, structure, classification, reproductive cycle
4. Systematic review of microorganisms, classification principles. Bacterial nomenclature
5. Microorganism testing methods. Basics of microscopy
6. Microorganism nutrition, distribution by the energy source, electron donor and carbon source. How do substances gain access to the microorganism cell?
7. The effect of environmental factors on microorganisms
8. The metabolism of microorganisms. Catabolic and anabolic reactions
9. The culture medium of microorganisms and their preparation
10. Cultivation of microorganisms, growth curve description
11. Quantification methods of micro-organisms and their biomass. Centrifugation
12. Sterilization, the main methods. Disinfection, physical and chemical disinfectants

13. Microorganism preservation and storage techniques. Collections of microorganisms

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, Practical classes/laboratory work, self-study, examination)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**CHEMICAL ANALYSIS**

**Entitlement** Quality of Chemical Analysis, 3 cr.

### Prerequisites

B1 level of English language

### Main aim

Provide students with the knowledge of the chemical analysis quality management in the laboratory, the necessity of chemical analysis, advantages, and basic quality support components, which is essential for a qualified chemical analysis specialist.

### Summary

The aim of the subject is to acquaint students with the quality policy and legitimising normative documents of a testing laboratory. Students discuss the need and advantages of the quality system in modern economic system, examine the progress of chemical analysis: plan, execution, description of phases, research report, and adjustment, learn to quantify the quality of chemical study applying the analysis uncertainty calculation, examine internal and external relations of the laboratory, study the legal aspect of analysis, and internal and external laboratory quality control system.

### Learning Outcomes

1. Be able to study documents regulating the competence of laboratories and apply the requirements in practice
2. Be able to characterise the specifics of chemical analysis and quality assurance possibilities
3. Be able to present advantages of the quality system to the audience
4. Be able to distinguish the basic quality system requirements and describe the quality policy of the laboratory
5. Be able to plan the time for practical tasks
6. Be able to independently distribute responsibilities to complete tasks
7. Be able to find solutions collegially to improve the laboratory quality management system
8. Be able to apply the international measurement system for the assessment of comparability of measurement results, reproducibility and traceability

### Syllabus

1. Quality assurance of chemical analysis: the necessity and advantages

2. Normative documents regulating the quality of the laboratory activity
3. Metrology in chemistry
4. Qualitative analysis: analyte, matrix. Measurement of material quantity: the detection and determination limit
5. Standard materials. verification and calibration of measuring instruments
6. Measurement uncertainty
7. External relation aspects of a research laboratory
8. The process of chemical analysis: plan, execution, description of phases, research report, and adjustment
9. Quality of chemical analysis results, internal and external quality control
10. The legal element of analysis. Quality policy. Laboratory archive. Assurance principles of measurement quality. Quality guide

### Evaluation procedure of knowledge and abilities

Cumulative assessment (intermediate settlements, self-study, examination)



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**FOOD TECHNOLOGY**

**Entitlement** Communication, 10 cr.

### Prerequisites

B1 level of English language. Secondary school knowledge in the Lithuanian and Foreign Languages, History

### Main aim

Provide knowledge of the state and foreign professional languages, improve communication skills, to develop understanding of the importance of the values of cultural heritage and to develop independent attitude towards the processes taking place in the social and professional environment.

### Summary

The aim of the module is to introduce students to the correct use of the official and foreign language in social and professional activities while communicating with company personnel and business partners. Changes in traditional culture are discussed, exploring the phenomenon of culinary heritage, food culture in contemporary culture. Students are introduced to cultural processes and their problems, and are given knowledge of intercultural communication.

### Learning Outcomes

1. Be able to express professional decisions using the correct written and spoken official and foreign languages.

2. Be able to describe the most common language errors in food technology process, correct them on the basis of relevant sources.
3. Be able to define cultural problems, evaluate cultural heritage trends and apply them in professional activities.
4. Be able to use professional vocabulary and apply communication skills communicating with the company personnel.

### Syllabus

Terminology - basis of special communication. Pronunciation and accentuation in the professional vocabulary.

The development principles of a scientific specialty text. The necessary parts of a written work.

Most common professional language vocabulary, word building, morphology, and syntax errors.

Work and career.

Professional conversations about foodstuffs, dishes, ingredients.

Professional conversations about catering business.

Menu - one of the most important parts of a catering enterprise.

Recipes, dishes, cooking.

Communication and collaboration in work environment.

The nature of culture, diversity of concepts, basic issues.

Understanding of cultural heritage and its dissemination in modern society.

Intercultural communication.

### Evaluation procedure of knowledge and abilities

The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

The final grade: Mid-term evaluation; Portfolio with integrated tasks; Examination.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

**FOOD TECHNOLOGY**

### Entitlement

Special Technologies Practical Training (Catering Enterprises Production Technology), 10 cr.

### Prerequisites

B1 level of English language, Basics of Exact Sciences, Chemistry, Nutrition and Food Chemistry, Food Safety and Quality, Foodstuffs Technology, Self-Development and Communication, Environment Protection and Labour Law, General Technological and Food Quality Professional Practice.

### Main aim

To provide students with practical skills needed for a catering enterprise production technologist to acquire professional competency of special technologies.

### Summary

The aim of the module is to overview the activities of the company and to analyse types of catering enterprises, the organization of work in production units and service opportunities. Students familiarize with the documents available in food companies: regulatory acts, hygiene requirements, equipment utilization and operating rules, visitor surveys, questionnaires, etiquette and ethics requirements. Students are involved in dish preparation, menu compilation and customer service processes.

### Learning Outcomes

1. Be able to organize company's production subdivision activities and customer service in different types of catering enterprises.
2. Be able to calculate amount of raw materials to implement production programme
3. Be able to adapt innovative achievements in dish preparation.
4. Be able to adapt safety and quality requirements in food production.
5. Be able to manage technological process according to safety and quality requirements.
6. Be able to evaluate service culture in a catering enterprise.

### Syllabus

Practice in the company, tripartite practice agreements, practice assignments, practice report. Types of catering enterprises. Work and service in catering enterprise's production and sales subdivisions.

Acceptance and storage of raw materials. Their preparation for production. Production losses. Calculation card. Production programme.

Principles and rules of menu compiling. Preparation and serving culinary and confectionary products.

Application of HACCP, GHP and GMP rules in catering enterprises. Questionnaire survey of customers – demand research

Regulations, regulatory acts, hygiene norms, requirements for catering enterprises. Equipment operation and maintenance.

Styles and types of customer service. Ethics and rules of professional conducts.

### Evaluation procedure of knowledge and abilities

The final grade is the arithmetic average grade of the grades given by the supervisor and the mentor. Preparation for the practice report.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**  
STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**VETERINARY**

**Entitlement** Animal Midwifery and Reproduction, 5 cr.

## Prerequisites

B1 level of English language

## Main aim

To provide the knowledge and skills necessary for the provision of first obstetric care, diagnosis and treatment of obstetric and gynecological diseases, maintenance and use of clinical equipment.

## Summary

Review principles and methods of treating obstetric and gynecological diseases, morphology, physiology, pathological processes of animal genital system, their causes. Show how to work with obstetrician-gynecological instruments and tools. Also show how the proper use of pharmaceutical veterinary medicines and equipment for prevention and treatment of diseases. Analyze clinic equipment, different diagnosis methods of genital system, obstetric surgery technique.

## Learning Outcomes

1. Will be able to provide first aid to mothers, newborns and pups.
2. Will be able to maintain and prepare video diagnostic equipment.
3. Will be able to prepare the animal for imaging procedures.
4. Will be able to perform simple obstetric operations and procedures on the order of a doctor.
5. Will be able to apply the knowledge of obstetrics and gynecology in determining the time of oestrus and pregnancy in pets.
6. Will be able to prepare animals for procedures and tests.

## Syllabus

1. Obstetric-gynecological instruments, devices and their application equipment.
2. Obstetric surgery technique.
3. Anatomical and physiological features of the animal reproductive system.
4. Diagnostic methods in obstetrics. Midwifery care and supervision.

## Evaluation procedure of knowledge and abilities

The studies of the subject (module) are completed with an exam or the defense / assessment of the project (independent work) completed by the student. The final assessment of the subject (module) consists of the sum of the interim assessments and exam (independent work (project)) assessments received during the whole semester, multiplied by the respective weighting coefficients assigned to them.



**VILNIUS UNIVERSITY OF APPLIED SCIENCES**

STUDY SUBJECT/MODULE PROGRAMME (SSMP)

VILNIAUS  
KOLEGIJA

**VETERINARY**

## Entitlement Surgery, 10 cr.

### Prerequisites

B1 level of English language

### Main aim

To provide the knowledge and skills necessary for the preparation of the operating field, for the provision of the first surgical aid, for the maintenance and use of the clinical equipment.

### Summary

There are reviewed the principles and methods of treatment of surgical diseases, pathological processes, their causes and auxiliary measures, prophylaxis of surgical infection, surgical diseases of the skin, blood vessels, lymph nodes, head, muscles, internal organs. There are demonstrated the work with surgical instruments and tools, the proper use of pharmaceutical veterinary medicines for the prevention and treatment of diseases. There are analyzed the work with clinical equipment, the diagnosis of surgical diseases by various methods, the technique of surgical operations.

### Learning Outcomes

1. Will be able to properly prepare the operating room and tools for surgical operations.
2. Will be able to provide first aid to an animal suffering from a surgical disease.
3. Will be able to care for animals in the postoperative period.
4. Will be able to select appropriate measures for the care of the animal in the postoperative period.
5. Will be able to give the animal a veterinary medicines prescribed by a doctor.
6. Will be able to prepare animals for surgery.
7. Will be able to assist a veterinarian during surgery.
8. Will be able to perform simple surgical operations on the order of a doctor.
9. Will be able to maintain the equipment of the veterinary clinic.
10. Will be able to prepare equipment and animal for video diagnostic research.
11. Will be able to assist the veterinarian in performing diagnostic tests.
12. Will be able to choose the right anesthesia equipment.
13. Will be able to prepare anesthesia equipment and materials.
14. Will be able to prepare the animal for anesthesia.
15. Will be able to assist the veterinary doctor in performing and maintaining anesthesia.

### Syllabus

1. Asepsis and antiseptics. Prevention of surgical infection. First aid. Tissue separation and assembly. Bleeding and stopping. Wound care. Opening of abscesses. Bone fractures.
2. Postoperative animal care. Surgical infection. Desmurgia. Medication. Injections. Infusions. Punctuation.
3. Surgical diseases, principles and methods of their treatment. Injuries. Castration. Simple surgical operations.
4. Principles and use of radiological examination in veterinary medicine. Ionizing radiation and radiation protection. Roentgen machine (structure, classification, operation, maintenance).
5. Exposure. Roentgen image receivers and their operation. Rules for the use of roentgen machines in veterinary medicine. Roentgen examination in animal practice. Safety measures. Animal restraints. Quality control.

6. Anesthesia. Anesthetic substances. Preparation of the animal for anesthesia, assistance during surgical operations.

### Evaluation procedure of knowledge and abilities

The studies of the subject (module) are completed with an exam or the defense / assessment of the project (independent work) completed by the student. The final assessment of the subject (module) consists of the sum of the interim assessments and exam (independent work (project)) assessments received during the whole semester, multiplied by the respective weighting coefficients assigned to them.



### Entitlement Architectural Graphics

#### Prerequisites

B2 level of English language

**Main aim** - to know the principles of architectural graphics that form the basis of the branch of engineering. To know the rules, methods, techniques of architectural graphics. To develop drawing and composition skills. To be able to process, evaluate and summarize the obtained graphic data and express them in landscape design projects.

**Summary** - the principles of architectural graphics rules, methods, techniques are reviewed. Drawing and composing skills are developed. It teaches how to process, evaluate and summarize the obtained graphic data and express them in landscape design projects.

#### Learning Outcomes

14. To creatively apply drawing and composition skills in creating and implementing projects.

#### Syllabus

1. Architectural graphics and basics of composition
2. Fundamentals of perspective theory
3. Linear construction drawing, tonal modeling
4. Sketching. Performance techniques, application possibilities
5. Contractual markings
6. Framing of landscape space

#### Evaluation procedure of knowledge and abilities

Cumulative assessment (practical tasks, independent work, exam)



**Entitlement** Herbaceous Ornamental Plants, 5 cr.

**Prerequisites**

B2 level of English language

**Main aim** To provide knowledge about herbaceous ornamental plants suitable for greenery, their cultivation, planting combination and application principles for greenery.

**Summary** The application area, purpose and classification of herbaceous ornamental plants are reviewed. Introduced to flowers cultivation, maintenance, propagation technologies. The selection of flower assortment for flower gardens and their combination principles are reviewed.

**Learning Outcomes**

- 15. Will know ornamental herbaceous plants, their agrobiological needs and the basic principles of their cultivation.
- 16. Will be able to select and combine flowers in various green areas, will select their growing technologies. Will use Latin names for herbaceous ornamental plants.
- 17. In the team will be able to carry out activities in accordance with the set goals, analyze and record the results of their activities and submit reports.
- 18. Will be able to adapt to changing professional conditions, and to choose a learning strategy.
- 19. Will be able to use scientific information, will take into account the recommendations of specialists in the activities.

**Syllabus**

- 1. The Importance of Ornamental Herbaceous Plants in Human life, the Possibilities of their Use. Classification of Flowers.
- 2. Biological Characteristics of Flowers. Systematics and Morphological Structure.
- 3. Biological Characteristics of Flowers. Factors Influencing Flower Growth and Decorativeness
- 4. Bioecological Classification of Flowers. Annuals, Biennials Perennial Flowers.
- 5. Generative and Vegetative Herbal Ornamental Plant Propagation. Renovation of Flower Gardens.
- 6. Selection of ornamental herbaceous plants for different types of flower gardens. Evaluation of flowers according to their decorative properties and the principles of their combination in greenery.

**Evaluation procedure of knowledge and abilities**

Subject studies are completed with an examination.

**Entitlement Prerequisites Professional Practice of Landscaping, 4 cr.**

B2 level of English language

**Main aim** - to provide special skills of greenery installation activities and to form skills to work independently in organizing landscaping works. Carry out vocational training in a practical environment, ensure links between theoretical knowledge and real work activities.

**Summary** - special abilities of landscaping activities are provided and skills to work independently in organizing greenery arrangement works are formed.

**Learning Outcomes**

Will apply technological knowledge of environmental management building materials and products and processes  
Greenery will be installed according to the projects.

**Syllabus**

1. Student professional practice tasks
2. Content and methods of the company's activity, implemented objects
3. Object execution task and conditions
4. Execution of specific works
5. Preparation and defense of a practice report

**Evaluation procedure of knowledge and abilities**

Cumulative assessment (Practice report)