Title of a course	**Chemistry, Biochemistry and Microbiology Basics**				
Study programme	Undergraduate Professional Study Programme of Sustainable Agritourism				
Status of a course	Obligatory				
Year of study	1	**Semester**	I	**ECTS credits**	5

Goals of a course

To acquaint students with the basic principles of chemical reactions and formation of compounds and the basics of chemical calculus. Inform about the types and uses of organic matter in plant production. Provide an overview of the main biochemical processes in the body and those that are used in the processing of agricultural products. Introduce students to different groups of microorganisms and principles of food microbiology. Expose different processes during canning and in fermentation processes of plant products.

Conditions for enrolling course

No conditions

Learning outcomes on a level of a study programme which includes course

Outcome 1: Explain the basic principles of chemistry, biochemistry, microbiology and botany required to work in the field of agriculture.
Outcome 2: Assess the suitability of environmental and edaphic factors for sustainable plant and animal production.
Outcome 3: Select species, assortments and breeds, as well as the technology for cultivation, breeding and maintaining the health of plants and animals.
Outcome 5: Select the methods of processing and preserving raw materials of plant and animal origin, depending on the quality characteristics of the raw material and the application of microorganisms.

Expected learning outcomes on a level of a course

1. Adopt basic chemical terms and solve computational problems.
2. Distinguish types of solutions and carry out measurements in a chemical laboratory.
3. Describe the properties and state the use of the elements and their inorganic compounds based on their chemical properties.
4. Distinguish organic compounds by their constitution and properties.
5. Explain the structure of the most important macromolecules, and describe the basic metabolic pathways and biochemical processes relevant to agriculture.
6. Describe the main groups of microorganisms and their role in nature and in the processing of agricultural products.

Content of a course

Structure of matter: atoms, molecules and compounds. The periodic table of elements. Chemical bonds. A state of matter. Relative atomic and molecular mass and amount of substance. Measurements and units in Chemistry. Types of solutions and quantitative expression of composition of solutions. Colloid solutions, acids and alkalis. Elements and compounds important tin the production and processing of agricultural products. Basics of organic chemistry: structure and characteristics of carbohydrates and their derivatives. Biochemical structure of the organism: proteins, sugars and fat. Vitamins, essential matter. An overview of important biochemical processes. Biochemical and organic-chemical transformations crucial for processing of agricultural products. Microorganisms: structure, classification and meaning in circulation of matter in nature. Microbiological processes in processing and preserving agricultural products and food.