

University undergraduate study programme Biology and Chemistry Education

Bachelor in Biology and Chemistry Education (univ. bacc. educ. biol. et chem.)

Learning outcomes of the study programme relative to legislative acts, requirements of applicable professional associations, demands of the labour market, possibilities for continuation of education and general social needs

- 1) Explain the relation between the organization of nature and the structure and life processes of different groups of the living world and biological subjects without cellular structure based on basic evolutionary and ecological theories, cellular, molecular and evolutionary mechanisms, inheritance processes and energy conversions.
- 2) Relate the complexity of different organizational levels of the biosphere by applying the principle of classification of the living world, and indicating the relatedness, diversity and evolution of the living world on Earth.
- 3) Hypothesize the outcome of natural phenomena, processes and relationships based on observations of nature and simple research.
- 4) Predict the impact of life habits and risk factors on the organisms' life cycles and health, with an aim of taking care for the living world and responsible behaviour towards own and other people's health.
- 5) Interpret basic chemical concepts on the factual and conceptual level in accordance with new scientific findings using chemical terminology and nomenclature.
- 6) Describe chemical changes by means of the chemical reaction equation and to explain its qualitative and quantitative meaning using stoichiometry.
- 7) Relate the structure of chemical compounds with their properties and chemical reactivity and to apply the methods of qualitative and quantitative analysis.
- 8) Explain the changes in structure, energy, and kinetics during chemical, biochemical, and physical processes.
- 9) Explain basic concepts and results of physics and elementary mathematics, differential and integral calculus, vector analysis, linear algebra and probability and statistics.
- 10) Design independent research and/or project in teaching of biology and chemistry with application of basic principles of the scientific approach and interpretation of research results.
- 11) Plan the application of efficient strategies, methods, techniques, and activities for teaching biology, chemistry, and school subject Nature.
- 12) Apply basic rules of safe work and independently use standard research methods when performing experiments, laboratory procedures and field investigations.
- 13) Integrate basic professional knowledge of biology and chemistry and encourage critical thinking in modelling, solving standard problems, and interpreting the results of observation and measurement.
- 14) Interpret basic concepts of general, developmental, and educational psychology and their application in the context of teaching biology, chemistry, and school subject Nature.

- 15) Describe the structure and development of knowledge in natural science and apply the scientific approach, scientific reasoning, and critical thinking.
- 16) Use basic measuring instruments and methods of data analysis when performing simple measurements, experiments and field investigations in biology and chemistry.
- 17) Independently select, prepare, perform and interpret school experiments and incorporate them in the elementary school biology, chemistry, and subject Nature lesson plan.
- 18) Independently use professional and scientific literature and other sources of information as well as the information and communications technology.
- 19) Take responsibility for their own learning, lifelong education, and professional development, and follow the development of new knowledge in biology and chemistry.
- 20) Present the topics of biology and chemistry in written and oral form in a logically consistent way; use the professional language in communication and writing professional papers.