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Name of subject	Field of study	Form of classes	ECTS points	Short summary
The Biology of Fish, Amphibians and Reptiles	Environmental Protection	Practical class	1	The course complements the "Zoology" course. During the course, students learn about the biology of fish, amphibians and reptiles at an advanced level than in the "Zoology" course. The content of the course taking into account the system of fauna systematics, the basics of fish, amphibians and reptiles as well as detailed national systematics of the fauna of fish and amphibians. The course will focus on the protection of fish, amphibians and reptiles. An important element field trip, during which students learn about the methodology of obtaining fish for research, researching anthropogenic transformation of a river posing a threat to the fishing environment, a fishing farm is also visited to study the breeding of endangered species.
Chemical Methods for Waste Management	Environmental Protection	Laboratory classes Auditorium classes	1 1	Raw material recycling, thermal technology for waste material. Oil and solvent regeneration, extraction, distillation, fat transesterification. Plastic recycling and the monomers recovery.
Analytical Instrumental Methods (S&N)	Chemistry	Lecture	2	Basic principles and applications of analytical instrumental methods (spectroscopic, electroanalytical and chromatographic)
Analytical Chemistry I	Chemistry	Laboratory classes	3	Lecture: basic terms of analytical chemistry; sampling; separation and pre-concentration

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(S&N)				methods; different types of chemical reactions applied in analytical chemistry Exercises: basic calculations; evaluation of uncertainties; tests for outlying results Laboratory: Introduction to gravimetric and volumetric methods; preparation of standard solutions
Analytical Chemistry II (S&N)	Chemistry	Lecture	1	Subsequent fields of classical chemical analysis: gravimetric methods; volumetric methods (acid-base; complexometric, redox and precipitation titration); Volumetric analysis: iodometric, acid-base and complexometric titration
Organic Chemistry (S)	Chemistry	Lecture Auditorium classes	3 2	The student has knowledge of the basics of organic chemistry including both hydrocarbons and its derivatives. In particular student knows: -criteria for classification of organic compounds jointly with naming rules, -physical properties and chemical reactivity of the most important groups of organic compounds, -types and mechanisms of organic reactions. Basics of lab safety procedures; basics operations and equipment in organic chemistry; synthesis and analysis of organic compounds
Physical Chemistry (S&N)	Chemistry	Lecture Laboratory classes	2 3	Principles and applications of thermodynamics in chemistry. The heat of reaction. Hess's and Kirchoff's principles. The thermodynamics functions. Chemical potential and its dependence of p and T. Activity and coefficient of activity. Equilibrium constants of a chemical reaction. Phase Transitions. Clausius-Clapeyron equation. The Gibbs phase rule.

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				The Raoult's and Henry's principles. Kinetics of simple and complex chemical reactions. Theories of reaction rate. The elements of catalysis. Liquids: density, viscosity and surface tension. Physicochemical properties of surface and colloids. Basics of electrochemistry: conductivity, electrodes, cells. Introduction to spectroscopy: interaction of the electromagnetic wave with a matter, absorption, emission. The fundamentals of spectroscopy. The elements of quantum chemistry and the examples of its practical application.
Trace Analysis (S)	Chemistry	Lecture Laboratory classes	1 2	Wet digestion of the samples; coprecipitation, ion exchange, liquid-liquid extraction. Using simple analytical techniques for the determination of trace metals
Theoretical Chemistry (S)	Chemistry	Lecture Auditorium classes	2 3	Lecture: Complex numbers. Special Functions. Orthogonal polynomials. Eigenfunctions and eigenvalues. Theorems of quantum mechanics. Heisenberg uncertainty principle. Solutions of Schrodinger equation. Variational and perturbation methods. One-electron postulate. Electron configuration. Atomic terms. SCF Method. Many-body problem. Ex. Operators. Position eigenfunctions. The particle in the box. The harmonic oscillator. Angular momentum. The hydrogen atom. For all listed above: eigenfunctions and eigenvalues, solution of Schrodinger equation, applications.
Computer-Aided New Drugs	Chemistry	Lecture IT Laboratory	2 3	Description of the main tools and methods used for in silico drug design. The most important options of

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Design (S)				available software and its application for solving particular problems in the field of new drug candidates discovery/design.
Algebra 2	Mathematics	Lecture Auditorium classes	2 3	Basics of group theory. Basics of ring and field theories. Applications.
The Mathematics of Property Insurance	Mathematics	Lecture IT Laboratory	1 2	Individual Risk Model. Cumulative Risk Model. Introduction to the theory of ruin.
Algorithmic Mathematics	Mathematics	Lecture IT Laboratory	1 2	Basics in some programming language. Analysis and implementation of some algorithms with their applications in mathematics.
Special Functions in Applications	Mathematics	Lecture IT Laboratory	1 2	Applications of selected classes of special functions (Euler gamma and beta functions, orthogonal polynomials, Bessel functions) in selected issues of natural and technical sciences.