

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KCH/Ch-BD107A/22	Course title: Physical Chemistry
Type and range of planned learning activities and teaching methods: Form of instruction: Lecture / Seminar / Laboratory practical Recommended study range: hours weekly: 2 / 1 / 3 hours per semester: 26 / 13 / 39 Teaching method: on-site	
Credits: 6	Working load: 150 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisites: KCH/Ch-BD104A/22	
Requirements for passing the course: During the semester, there will be written examinations on exercises from each topic, for each of which it is possible to obtain a maximum of 5 points. At the final oral exam, the student can get max. 60 points.	
Learning outcomes of the course: The aim is to provide students with a theoretical basis for understanding chemical phenomena and processes as well as to develop the student's logical and abstract thinking. Students are able to theoretically describe chemical phenomena and deduce relevant conclusions based on this knowledge. The aim of the laboratory exercise is to teach students to implement the basic methodologies of physical-chemical measurements, and to practically apply the acquired theoretical knowledge and perform the necessary physico-chemical calculations.	
Course contents: <ol style="list-style-type: none"> 1. Ideal gas. Equation of state of an ideal gas. 2. Van der Waals equation of state of real gas. Critical state of gas. Theorem of corresponding states of real gases. 3. Chemical thermodynamics. I. law of thermodynamics. Enthalpy. Heat capacity. 4. Adiabatic process. Thermochemistry, Kirchhoff's equations. 5. Second law of thermodynamics, Entropy. 6. Gibbs and Helmholtz function. Clausius and Clapeyron's equation 7. Gibbs phase law. Fugacity and activity. Raoult and Henry's law 8. Chemical equilibria. Van't Hoff's isobara. The third law of thermodynamics 9. Chemical kinetics. Rate of chemical reaction. Gulberg-Waage law. Molecularity and order of reaction. Kinetic equations of first, second and third order reactions. Methods for determining the order of reaction. 10. Kinetics of reversible, simultaneous (parallel and sequential). Dependence of rate constant on temperature, Arrhenius equation, kinetic theories. Catalytic and autocatalytic reactions. Michaelis-Menten kinetics. 11. Electrochemistry. Electrolysis and Faraday's laws. Galvanic cells. Electromotive voltage. Electrode and standard potential. Nernst's equation. 	

12. Types of electrodes. Concentration articles. Diffusion potential. Glass electrode. Nikol'ského equation. Batteries. Electrode processes. Laboratory exercise: Determination of molar mass. Determination of melting point, solidification temperature, boiling point. Determination of density of liquids by densitometers, pycnometrics, Mohr scales. Determination of viscosity of liquids. Refractometry. Spectrophotometry. Potentiometry. Conductometry					
Recommended or required literature: 1. Atkins P.W.: Physical Chemistry, Oxford university press 2017 2. Moore W.J.: Physical chemistry, Pearson College Div; 4th edition (June 1, 1972)					
Language of instruction:					
Notes:					
Course evaluation: Assessed students in total: 4					
A	B	C	D	E	FX
0.0	0.0	0.0	0.0	100.0	0.0
Name of lecturer(s): Prof. Ing. Peter Tomčík, PhD., Ing. Renata Bellová, PhD.					
Last modification: 28.11.2023					
Supervisor(s): Guarantor: Administrátor Systému People responsible for the delivery, development and quality of the study programme: prof. ThDr. Rastislav Adamko, PhD., doc. Mgr. Marek Babic, PhD., doc. RNDr. Pavel Bella, PhD., prof. PaedDr. Mgr. art. Rastislav Biarinec, ArtD., prof. Irina Chelysheva, DrSc., prof. PaedDr. František Dlugoš, PhD., Mgr. Juraj Dvorský, PhD., prof. PhDr. Ingrid Emmerová, PhD., doc. Tatiana Korenkova, CSc., prof. PaedDr. Milan Ligoš, CSc., doc. Mgr. Eva Litavcová, PhD., doc. PaedDr. Peter Mačura, PhD., prof. PhDr. David Papajík, PhD., doc. Ing. Miroslav Saniga, CSc., prof. Nóra Séllei, PhD., DrSc., PhDr. ThLic. Martin Taraj, PhD., Prof. Ing. Peter Tomčík, PhD., prof. Dr. phil. fac. theol. Peter Volek, doc. Ing. Igor Černák, PhD.					