

Nazwa zajęć/ <i>Course title:</i>	Chemia ogólna i fizyczna	ECTS	7
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	General and physical chemistry		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	Biotechnologia		

Język kursu/ <i>Course language:</i>	English	Poziom studiów/ <i>Study level:</i>		I
Typ studiów/ <i>Form of studies:</i>	X intramural .. extramural	Status zajęć/ <i>Course status</i>	X podstawowe/ <i>Basic</i> kierunkowe/ <i>major</i>	X obowiązkowe/ <i>mandatory</i> .. do wyboru/ <i>elective</i>
		Semestr/ <i>Semester:</i>		1
				X semestr zimowy/ <i>winter semester</i> .. semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		2022/2023	Numer katalogowy/ <i>Catalogue number:</i>	BBT_BTa-1S-1Z-5

Koordynator zajęć/ <i>Course coordinator:</i>	Prof. Dr hab. Piotr Koczoń			
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	The Staff of Department of Chemistry of Institute of Food Sciences			
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p>Acquiring a basic knowledge from general and physical chemistry necessary for studying major subjects. Familiarization of the student with laboratory equipment and work in the laboratory including independent working. Formation a skills of self-performing chemical calculations, appropriate analyzing of raw experimental data, drawing correct conclusions from conducted experiments and writing clear lab-reports.</p> <p>Lecture topics: Atomic structure. Electronic configuration. Periodic Table. Intra and inter molecular chemical bonding. States of matter. Phase changes. Thermodynamics. Heat effects of chemical processes. The rate of chemical reactions including catalysis. Equilibrium. Water product. pH scale of water solutions. Solubility product. Voltaic cells and electrolysis. Spectroscopy. The Lambert-Beer law. Surface phenomena. Colloids. Properties of selected element from main groups of Periodic Table.</p> <p>Laboratory class topics: The rules of operating in chemical laboratory. The reactions occurring in water solutions – reactions without change of oxidation state, complexation reactions, redox reactions. Chemical analysis of salts (analysis of cations and anions). Quantitative analysis. Complexometric, manganometric, and acid-base titration. Instrumental analysis potentiometry, conductometry, colorimetry.</p>			
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	a) Lecture; number of didactic hours: 45 b) laboratory classes; number of didactic hours: 30			
Metody dydaktyczne/ <i>Teaching methods:</i>	Lectures: use of presentations, short movies and animations, descriptions, giving adequate examples, questioning. Laboratory classes: independent performing of experiments, observations, measuring, description. Consultations in terms of face to face or remote meetings with use of MS TEAMS application.			
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	The knowledge of chemistry at standard level of Polish mature exam.			
Efekty uczenia się/ <i>Learning outcomes:</i>	treść efektu przypisanego do zajęć/ <i>the content of the effect assigned to the course:</i>		Odniesienie do efektu kierunkowego <i>/Relation to the course outcomes</i>	Siła dla ef. kier* <i>/Impact on the course outcomes*</i>
Wiedza (absolwent zna i rozumie) <i>/Knowledge: (the graduate knows and understands)</i>	W1	Student knows and understands basic concepts and principles from general and physical chemistry, discussed during classes and knows how to apply them to describe chemical processes.	K_W07 K_W10	2 2
	W2	Student is aware of threats resulting from work in chemical laboratory, he / she knows a rules of behaving in chemical labs	K_W11	2
Umiejętności (absolwent potrafi) <i>/Skills: (the graduate is able to)</i>	U1	Students is able to apply learned principles and dependences to perform chemical calculations, especially those related to concentrations of solutions, pH of solutions, thermochemistry, solubility product, kinetics of chemical reactions, electrochemistry and spectroscopy.	K_U05	2
	U2	Student is able to select and perform appropriate chemical reactions to qualitatively analyze selected inorganic salts.	K_U06 K_U16	2 1
	U3	Students can operate standard laboratory equipment and use it to perform different type of titrations e.g. complexometric titrations, redox titrations, conductometric titrations, acid-base titrations and colorimetric measurements.	K_U06	2
Kompetencje (absolwent jest gotów do) <i>/Competences: (The graduate is ready to)</i>	K1	Student is ready for team cooperation to perform chemical marking and report on experiments done and results collected.	K_K02 K_K03	1 1
	K2	Student is ready for team cooperation to perform chemical marking and report on experiments done and results collected.	K_K02 K_K03	1 1

Treści programowe zapewniające uzyskanie efektów uczenia się: /Program contents ensuring the achievement of the learning outcomes:		Systematic knowledge from general and physical chemistry required for studying major subjects. Standard laboratory equipment. Principles of working in chemical laboratory. Formation of skills to conduct chemical calculations, independent work in the laboratory, drawing correct conclusions from performed experiments, clear reporting on experimental results.		
Sposób weryfikacji efektów uczenia się/ Methods of the verification of the learning outcomes:		Written exam Tests during labs Practical tasks in terms of correct chemical experiment performance and results presentation Marking of practical lab performance.		
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się /Details on the verification methods and of the ways of documenting the learning outcomes:		The content of tasks stated during tests. List of students marks from tests and reports on experiments done. The content of exams questions followed by list of students marks.		
Elementy i wagi mające wpływ na ocenę końcową/Elements and weights influencing the final grade:		To verify effects of teaching following are used: (1) the grade from practical tasks done in the laboratory ; (2) the grade from tests conducted during labs; (3) exam Paper 1 - to check the knowledge of concepts, principles and ability to apply them to describe chemical processes (4) exam Paper 2 - to check skills of solving problems covering chemical calculations. For every of above listed components there is maximum number of marks to be scored i.e. 1-15 marks, 2-25 marks, 3-30 marks, 4-30 marks, (100 marks together). The Student who gain not less than 50% from every component is considered to pass: 1) 7,5 marks, 2) 12,5 marks, 3) 15 marks, 4) 15 marks] The final grade depends on the sum of marks collected : 50.5-60 marks – grade 3.0; 60.5-70 marks – grade 3.5; 70.5-80 marks – grade 4.0; 80.5-90 marks – grade 4.5; 90.5-100 marks – grade 5.0.		
Miejsce realizacji zajęć/ Teaching place:		Lectures are performed in hall and labs in lab-classes of Department of Chemistry. If necessary all classes are conducted online (Teams).		
Literatura/Literature: 1		Literature: (1) Bielański, Podstawy chemii nieorganicznej, Wyd. PWN, W-wa 2008 (oraz wydania późniejsze). (2) Jones L., Atkins P.: Chemia ogólna. Częsteczki, materia, reakcje, PWN, Warszawa 2004 (oraz wydania późniejsze). (3) Praca zbiorowa, Ćwiczenia z chemii nieorganicznej i analitycznej, Wyd. SGGW 2011. (4) Praca zbiorowa, Ćwiczenia z chemii ogólnej i analitycznej, Wyd. SGGW. (5) Praca zbiorowa: Zadania z chemii, Wyd. SGGW.		
UWAGI/ANNOTATIONS				

*) 3 – zaawansowany i szczegółowy, 2 – znaczący, 1 – podstawowy/ 3 – significant and detailed, 2 – considerable, 1 – basic,

Wskaźniki ilościowe charakteryzujące moduł/przedmiot/Quantitative summary of the course:

Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS /Estimated number of work hours per student (contact and self-study) essential to achieve the presumed learning outcomes - basis for the calculation of ECTS credits:	170 h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ Total number of ECTS credits accumulated by the student during contact learning:	3 ECTS