

Course title Chemia ogólna / General chemistry		ECTS code 13.3.0855	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Bachelor	Full-time studies	
Teaching staff Prof. dr hab. inż. Lech Chmurzyński			
Forms of classes, the realization and number of hours		ECTS credits 8	
A. Forms of classes, in accordance with the UG Rector's regulations lecture, auditorium classes, laboratory classes		classes - 120 h tutorial classes – 15 h student's own work – 65 h	
B. The realization of activities multimedia presentation, in-class learning, laboratory experiments		Total: 200 h - 8 ECTS	
C. Number of hours 120 h (Lecture 45 h, auditorium classes 45 h, laboratory classes 30 h)			
The academic cycle First year, winter semester			
Type of course obligatory		Language of instruction English	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
<u>Lecture</u> with the use of the multimedia presentation on the basic issues of chemistry; During the <u>auditorium classes</u> students will learn about the different aspects of general chemistry and solve different exercises faced by the teacher (on the board and individually in the notebooks). Practical laboratory work - chemical experiments, analysis of obtained results and discussion.		A. Final evaluation, in accordance with the UG study regulations lecture - exam, auditorium classes – Course credit with a grade laboratory classes – Course credit with a grade	
		B. Assessment methods <u>Lecture</u> – exam with open questions <u>Auditorium classes</u> – two tests Laboratory classes – short tests and reports	
		C. The basic criteria for evaluation or exam requirements <u>Lecture</u> : positive note from an exam with 15-20 open questions: 91-100%: 5.0 81-90%: 4.5 71-80%: 4.0 61-70%: 3.5 51-60%: 3.0 < 51%: 2.0 <u>Auditorium classes</u> : positive note from two tests, final note is an average from notes from both tests 91-100%: 5.0 81-90%: 4.5 71-80%: 4.0 61-70%: 3.5 51-60%: 3.0 < 51%: 2.0 <u>Laboratory classes</u> : positive note from all short tests and reports, final note is an average from notes from all tests 91-100%: 5.0 81-90%: 4.5 71-80%: 4.0 61-70%: 3.5 51-60%: 3.0 < 51%: 2.0	

## Required courses and introductory requirements

Formal requirements – lack

Introductory requirements – lack

## Aims of education

- familiarize students with the main aspects of general chemistry and classes of inorganic compounds
- familiarize students with the balancing chemical equations
- presenting the basis of chemical calculations

## Course contents

**Topics of the lecture:** atomistic theory of matter (atomic nucleus, isotopes, electronic structure of atoms, quantum numbers, atomic orbitals), basic chemical terms and laws, periodic table of elements, chemical equations (including redox reactions), chemical bonds, basic types of inorganic compounds, stoichiometry, solutions and their concentrations, thermochemistry, kinetics and chemical equilibrium, theories of acids and bases, electrolytic dissociation, pH scale, pH of solutions of strong and weak acids and bases, buffer solutions, hydrolysis, elements of electrochemistry.

**Topics of auditory classes:** basic chemical terms and laws, basic types of inorganic compounds, balancing redox reactions, stoichiometry, the concentrations of the solutions, kinetics and chemical equilibrium, equilibria in the solutions of electrolytes.

## Bibliography of literature

### A. Literature required to pass the course

J. D. Lee – *Concise inorganic chemistry*

L. Jones, P. Atkins – *Chemical principles*

### B. Extracurricular readings

L. Pauling – *General chemistry*

M. J. Sienko, R. A. Plane – *Chemistry: Principles and properties*

## Knowledge

Students: know main states of matter; understand structure and properties of atoms as well as other chemical particles; understand essence of main types of chemical bonds; understand main chemical terms, laws and phenomena, know basic terminology and symbolism in terms of elements, inorganic compounds, electrolytes, electrolytic dissociation as well as chemical reactions in water solutions; know physicochemical properties of chosen elements and chemical compounds (oxides and hydrides of metals and nonmetals, bases, acids and salts); know main applications of known chemical substances as well as threats connected with their inappropriate use; know main techniques of calculations in chemistry.

## Skills

Students: present plainly – in both speech and writing – correct chemical argumentation; present and explain chemical phenomena and processes, i.e. write molecular and ionic equations for chemical reactions, interpret qualitatively and quantitatively equations for chemical reactions; interpret and analyze information connected with chemistry presented as text, tables, plots, schemes, figures; formulate descriptions of different chemical phenomena and processes, describe them with use of own words and figures (schemes); explain similarities and differences in properties of elements, relations between structure of substances and their properties; notice causal links in chemical processes performed in different conditions, where typical chemical reactions occur; explain course of different phenomena from everyday life with the use of chemical knowledge in correlation with other sciences; interpret information, formulate conclusions and explain opinions.

## Social competence

Students: understand need for learning, inspire other for learning; cooperate in group, taking different roles; exhibit creativity in determination of priorities necessary for realization of different tasks; understand social aspects of practical use of knowledge and abilities as well as connected with them responsibility.