



## Subject card

Subject name and code	Chemistry, PG_00044684						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2021/2022		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Małgorzata Szopińska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: Chemia Budow. (niestac. II sem) 21/22 - Moodle ID: 16647 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16647">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16647</a>						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		65.0	100
Subject objectives	<div>1. To acquaint students with the basics of general chemistry at the academic level</div> <div>2. Presentation of aspects related to the creation and destruction of various classes of building materials</div> <div>3. Acquainting students with the chemical aspects of building materials protection against destruction (including corrosion protection)</div> <div>4. Acquainting students with the laboratory research of building materials</div>						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W01] has knowledge of selected branches of mathematics, physics and chemistry, which is a base of construction subjects, such as construction theory and material technology and id needed to formulate and solve typical problems of civil engineering		1. The student knows and understands the theoretical basis of chemical and physicochemical processes occurring in building materials during their production and application 2. The student has knowledge of the laboratory methods during building materials research		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W71] has general knowledge in humanistic, social, economic or legal sciences		01-Knows and understands the basic principles and ethical standards as well as the concepts and selected legal provisions.		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	1. ATOM and MATTER STRUCTURE 2. CHEMICAL BINDINGS, SYSTEMATICS OF INORGANIC COMPOUNDS 3. CHEMICAL REACTIONS (stoichiometry, basics of thermodynamics and kinetics) 4. WATER (physicochemistry of water, water in building materials, dissociation) 5. BASICS OF ELECTROCHEMISTRY 6. METAL CORROSION 7. DISPERSION SYSTEMS (colloids, emulsions, solutions, separation of mixtures) 8. CHEMISTRY OF MINERAL MATERIALS 9. CHEMISTRY OF ORGANIC MATERIALS 10. CONCRETE CORROSION, TECHNICAL GASES		
Prerequisites and co-requisites	1. The student has basic knowledge of general chemistry (solves basic computational problems, correctly writes equations of simple chemical reactions reaction reaction stoichiometry)  2. The student knows the symbols of chemical elements as well as the molecular and structural formulas of basic acids, bases and salts  3. The student knows the basic physical and chemical phenomena (e.g. phase transitions of water, neutralization reaction)  4. Is aware of the importance of chemical phenomena in social life and the civil engineering.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	60.0%	100.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"><li>T. Broniewski, L. Czarnecki, O. Henning Chemia w budownictwie, Wydawnictwo Arkady, Warszawa, 2018</li><li>Edward Szymański Materiały budowlane Tom 1, Podręczniki Wyższej Szkoły Ekologii i Zarządzania, 2011</li></ul>	
	Supplementary literature	Open AGH e-textbooks - peer-reviewed academic-level e-textbooks for science, developed by AGH employees for any use.  Link: <a href="https://epodreczniki.open.agh.edu.pl/openagh-podreczniki.php?categId=82">https://epodreczniki.open.agh.edu.pl/openagh-podreczniki.php?categId=82</a>	
	eResources addresses	Chemia Budow. (niestac. II sem) 21/22 - Moodle ID: 16647 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16647">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16647</a>	
Example issues/ example questions/ tasks being completed	What is the pH of the solution in which the concentration of hydroxide ions is $3.5 \cdot 10^{-5} \text{ mol / dm}^3$ .  What are asphaltenes?  What is the phenomenon of corrosion?  How is an atomic bond different from an ionic bond?		
Work placement	Not applicable		