GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemistry I, PG_00044161		
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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
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, Budownictwo (stac.; II sem 21/22) - Moodle ID: 16646
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16646

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	40.0	75

Subject objectives

1. To acquaint students with the basics of general chemistry at the academic level

2. Presentation of aspects related to the creation and destruction of various classes of building materials

3. Acquainting students with the chemical aspects of building materials protection against destruction (including corrosion protection)

4. Acquainting students with the laboratory research of building materials

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K02] is responsible for reliability of obtained results of research and its interpretation, formulates conclusions and describes results of own work	1. student on the basis of the acquired knowledge can characterise physicochemical properties building materials 2. the student is able to write in forms of chemical reactions (a) mineral and hydraulic binder bonding processes, (b) polymer formation processes, (c) corrosion processes of building materials.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
[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

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. WASTEWATER - characteristics and technologies of treatment 11. WATER - characteristics and technologies of treatment 12. 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	• T. Broniewski, L. Czarnecki, O. Henning Chemia w budownictwie, Wydawnictwo Arkady, Warszawa, 2018 • Edward Szymański Materiały budowlane Tom 1, Podręczniki Wyższej Szkoły Ekologii i Zarządzania, 2011
	Supplementary literature	Open AGH e-textbooks - peer-reviewed academic-level e-textbooks for science, developed by AGH employees for any use. Link: https://epodreczniki.open.agh.edu.pl/openagh-podreczniki.php?categId=82
	eResources addresses	Chemia, Budownictwo (stac.; II sem 21/22) - Moodle ID: 16646 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16646
Example issues/ example questions/ tasks being completed	What is the pH of the solution in which the concentration of hydroxide ions is 3.5 * 10-5 mol / dm3. What are asphaltenes? What is the phenomenon of corrosion? How is an atomic bond different from an ionic bond?	
Work placement	Not applicable	