



Faculty of Civil and Environmental Engineering			
Study programme:	<b>Construction and Building Systems Engineering</b>	Degree level:	full-time programme: <b>Bachelor's degree</b>
Specialization:		Diploma path:	
Module name:	<b>Chemistry</b>		
Module type:	<b>obligatory</b>	Semester: <b>1</b>	ECTS <b>4</b> Module ID: <b>CBSE1112</b>
No. of hrs in semester:	L - 15	C -	LC- 30 P- SW- S-
Prerequisites:	<i>Complete with prerequisites or "."</i> <span style="float: right;">"."</span>		
Aims and objectives:	To acquaint students with the characteristics of different groups of inorganic and organic chemical compounds. To familiarize students with the basic concepts, rules and chemical reactions. Teaching students how to use the chemical nomenclature and write chemical reaction equations and perform basic chemical calculations; use basic laboratory techniques; perform qualitative and quantitative analysis; understanding of basic chemical processes of importance in construction.		
Forms of teaching activities:	<i>lecture, laboratory classes,</i>	Assessment:	<i>Evaluation must be relevant to the intended learning outcomes</i>
		lecture – written tests, laboratory classes – evaluation of reports, verification of preparation for classes, tests;	
Module content:	Atoms - composition, electronic structure. Basic concepts and chemical laws. Characterization of main groups' elements. Inorganic compounds - properties and application. Chemical bonds and structure of molecules. Intermolecular bonds. Different types of solution. Concentration of solution. Types of chemical reactions. Rate of chemical reactions. Catalysis. Elements of quantitative analysis. Alkacymetry, manganometry, complexometry. Equilibrium in aqueous solutions. Electrolytic dissociation. Strong and weak electrolytes. Hydrolysis. pH measurement. Buffers. Water hardness. Reactions in water solution. Analysis of cations, anions and salts properties. Redox reactions. Bases of electrochemistry - electrolysis, cells. Properties of metals. Corrosion. Heavy metals in environment. Classification of organic compounds. Nomenclature. Basic reactions of organic compounds.		
Teaching methods:	<i>lectures using multimedia presentation, laboratory work, demonstrations</i>		
Learning outcome	<i>Specify min. 4, max. 8 learning outcomes in the following order: knowledge – skills – competence. Each learning outcome must be verifiable</i>		<i>Reference to the programme learning outcomes</i>
LO1	Student has the knowledge of chemistry, which is the core technology of building materials		CBSE_W01
LO2	Student has knowledge of chemistry necessary to understand the processes occurring in the environment		CBSE_W17
LO3	Student is able to perform and interpret the results of simple laboratory experiments		CBSE_U07
LO4	Student is able to work individually and in a team		CBSE_U19
LO5	Student is aware of the responsibility for own work as well as teamwork, and responsibility for jointly implemented tasks.		CBSE_K02
No. of learning outcome	Methods of assessing the learning outcome		Type of teaching activities (if more than one) during which the outcome is assessed
LO1	evaluating the student's reports and preparation for the classes, tests on the lecture content		L, LC
LO2	evaluating the student's reports and preparation for the classes, tests on the lecture content		L, LC
LO3	evaluating the student's reports, evaluation of the student work in the laboratory		LC
LO4	evaluating the student's reports; evaluation of the student's performance in the laboratory classes		LC
LO5	evaluation of the student's performance in the laboratory classes		LC
Student workload (in hours)	lecture attendance		7,5x2h= 15
	participation in classes, laboratory classes, etc.		15x2h= 30
	preparation for classes, laboratory classes, projects, seminars, etc.		25
	working on projects, reports, etc.		10
	participation in student-teacher sessions related to the classes/seminar/project		5
	implementation of project tasks		
	preparation for and participation in exams/tests		15
	TOTAL:		100
Quantitative indicators	Student workload – activities that require direct teacher participation: (15+30+5)		50 ECTS 2
	Student workload – practical activities: (30+25+10+5)		70 2,5
Basic references:	<ol style="list-style-type: none"> <li>1. Saterus M., Fornalczyk A., <i>Chemistry for every student, Politechnika Śląska, Gliwice 2013;</i></li> <li>2. Chojnacki J., Dołęga A., Dręcowski B. <i>"Selected topics in general and inorganic chemistry; Politechnika Gdańska, Gdańsk 2001;</i></li> <li>3. Crowe J., Bradshaw T., <i>Chemistry for the Bioscience, Oxford University Press, Oxford 2010.</i></li> <li>4. <i>Instructions for laboratory exercises, available at the Division of Chemistry</i></li> </ol>		
Supplementary references:	1. Housecroft C. E., Sharpe A.G., <i>Inorganic chemistry, Pearson Education, Harlow 2008.</i>		
Unit:	Department/Division/etc.	Division of Chemistry	
Date of issuing the programme:	2017-02-01	Author of the programme:	Mariola Samsonowicz, Phd Monika Kalinowska, PhD