SYLLABUS Academic year 2017-2018

Name of a course / module	**CHEMISTRY**
Name of a department where course is held	**Department of Medical Chemistry**
E-mail of department	**zachemog@umb.edu.pl**
Faculty of	Medicine with Division of Dentistry and Division of Medical Education in English
Name of a field of study	Medicine
Level of education	Uniform master's degree studies
Form of study	full time ■ part time ☐
Language of instruction	Polish ☐ English ■
Type of course	obligatory ■ facultative ☐
Year of study / Semester	I ■ II ☐ III ☐ IV ☐ V ☐ VI ☐ 1 ■ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 10 ☐ 11 ☐ 12 ☐
Introductory courses with preliminary requirements	Getting credit according to recruitment procedure
Number of didactic hours with specification of forms of conducting classes	Lectures: 8 Classes: 22
Assumptions and aims of the course	Student should get the knowledge in the field: water-electrolyte and acid-base equilibrium of biological systems in human organism; the properties of real and colloidal solutions; reactions of inorganic compounds and functional groups of organic compounds in water solutions. Student should know how: to determine chemical properties of molecules in relation to their structure; to use chemical calculations to describe phenomena occurring in solutions; to utilize basic laboratory technics and to plan simple experiments.
Didactic methods	- delivering a knowledge in a form of lectures - consultation (regular – once a week, Wednesdays 12.00 - 13.00 and individual for the request of the students) - discussion - self study - other practical classes (observations, individual experiments)
Full name of the person conducting the course	Scientific and teaching staff employed in the Department of Medical Chemistry
Full name of the person responsible for teaching	dr hab. Iwona Radziejewska

Symbol and number of learning outcomes according to the teaching standards and other learning outcomes	**Description of directional learning outcomes**	**Form of classes**	**Verification methods for achieving intended learning outcomes**
	Knowledge		
B.W1	knows how to describe water-electrolyte equilibrium of biological systems	lectures classes	Summarizing methods:, - written final test Forming methods: - observation of the student's work - evaluation of the activity in the classroom - assessment of preparation for classes - discussion in class - partial tests
B.W2	knows how to describe acid-base equilibrium, buffer action mechanism and its significance for systemic homeostasis	lectures classes	
B.W3	knows such terms as solubility, osmotic pressure, isotonia, colloidal solution and Gibbs-Donnan equilibrium	lectures classes	
B.W4	knows basic inorganic and organic compound reactions in aqueous solution	lectures classes	
	Skills		

B.U3	calculating molar and percentage concentration of the compounds as well as concentration of substances in single- and multi-component isotonic solutions	classes	Summarizing methods: - realization of a specific task Forming methods: - observation of the student's work - evaluation of the activity in the classroom - completion of each activity - discussion in class - partial tests
B.U5	defining pH of the solution and impact of pH modification on organic and inorganic compounds	classes	
B.U9	using fundamental laboratory techniques, such as qualitative analysis, titration, pH-metry,	classes	
Social competence			
K1	abide the professional secrecy and patients law	classes	Summarizing methods: Continuous assessment by teachers (observation) Forming methods: - observation of the student's work - discussion in class - opinions of colleagues
K2	can work in a team of professionals, in multicultural and multiethnic environment	classes	
K4	be aware of his/her own limitations and need to improve their skills continually	classes	

ECTS points	2
Student Workload	
Form of activity	**Number of hours to complete the activity**
Classes that require the participation of a teacher	
1. Realization of the course: lectures (according to the curriculum)	8
2. Realization of the course: classes (according to the curriculum)	22
3. Realization of the course: seminars; (according to the curriculum)	
4. Realization of the course: electives	
5. Participation in consultation	10
	Total hours: 40
Student self-study	
1. Preparation for the theoretical and practical classes (realization of projects, documentation, case description etc.)	5
2. Preparation for tests/credits	5
3. Preparation for an exam/final test-credit	5
	Total hours: 15

Course contents:	
Learning outcomes (symbol and number)	**Topics**

	Lectures:
1. B.W1 - describe water-electrolyte equilibrium of biological systems 2. B.W2 - describe acid-base equilibrium, buffer action mechanism and its significance for systemic homeostasis	Properties of water and its biological importance. Main ions of body fluids. Buffer mixtures – a mechanism of pH stabilization, buffer capacity. A role of physiological buffers in maintaining of a stable pH of physiological fluids. Alkacymetry as an example of titration analysis – alkacymetric indicators, titration curves.
3. B.W3 - knows such terms as solubility, osmotic pressure, isotonia, colloidal solution and Gibbs-Donnan equilibrium	Solutions – types of solutions, solubility, types of expression of solution concentration. Colloidal solutions. Lyophobic and lyophilic colloids. Colligative properties of solutions. Diffusion and osmosis, osmotic and oncotic pressure. Gibbs-Donnan equilibrium.
4. B.W4 - knows basic inorganic and organic compound reactions in aqueous solution	Selected organic compounds with biological importance. Carboxylic acids, carbohydrates. Isomerism and derivatives of simple carbohydrates. Aromatic and heterocyclic compounds, drugs and macromolecules. Oxygen free radicals - formation and structure, harmful effect on proteins, unsaturated fatty acids and DNA. Defensive mechanisms of human body.
	Classes:
5. B. W4 - knows basic inorganic and organic compound reactions in aqueous solution	Characteristic reactions of biologically important ions. Determination of functional groups in organic compounds (carbohydrates, carboxylic acids, fats, aromatic and heterocyclic compounds).
6. B.U3 - calculating molar and percentage concentration of the compounds as well as concentration of substances in single- and multi-component isotonic solutions	Solutions and their properties – preparation of solutions with specific molar and percent concentrations, converting of concentrations; lyophilic and lyophobic colloids preparations, examination of protective properties of lyophilic colloids; observation of creation of osmotic pressure of the solution
7. B.U5 - defining pH of the solution and impact of pH modification on organic and inorganic compounds	Buffer solutions – buffers preparations and their pH determination using indicators and pH-meter. Determination of the influence of buffer dilution on pH and buffer capacity. Assigning of dissociation degree and dissociation constant of electrolytes.
8. B.U9 - using fundamental laboratory techniques, such as qualitative analysis, titration, pH-metry	Alkacymetry as an example of titration analysis – quantitative determination of weak and strong acid.

Obligatory textbook:
1. Timberlake K. C. “General, organic and biological chemistry”
Optional textbook:
2. Bresnick S. “High-yield general chemistry”

Criteria for assessing the achieved learning outcomes and the form and conditions for receiving credit:

Students are obliged to attend all classes**.** Absences should be excused as soon as possible. In case of illness, a doctor's leave should be presented; any other absences should be confirmed by the dean or proper authorities. Excused absences should be make up in a fixed time**.** The consequence of unexcused absences is lack for credit at Chemistry.

To get credit of the whole course students should pass all the classes and a written final test. The condition to get credit from classes and to be admitted to the final test is obtaining 30 points. In case of less than 30 points, students may not get credit at Chemistry**.**

The conditions of passing the class:

a) performing experiments with showing an understanding of a sense of carried procedures;
b) writing a report from practical part of the class;
c) credit from a written partial class test.

During classes students can get the following number of points:

● oral answer	2 points
● written partial class test	9 points
● performing experiments	3 points
maximum possible number of points	14 points/one class 70 points/all classes

Students who obtain totally at least 53 points (but not less than 5 points from individual written class test) can be relieved of writing the final written test (they get credit at whole Chemistry course)**.**
The final test includes subjects from lectures and classes. The condition to get credit at the final test is obtaining 60 % of maximum number of points.

28.09.2017 dr hab. Iwona Radziejewska
……..
(date and signature of the person preparing the syllabus)

28.09.2017 dr hab. Anna Galicka
……
(date and signature of the Head of the Department where the course is held)

and

dr hab. Iwona Radziejewska
……
(course coordinator)