Study program: Integrated Academic Studies of Medicine

Type and level of studies: Doctor of Medicine (MD) (360 ECTS)

Course unit: MEDICAL CHEMISTRY

Teacher in charge : Full Professor Nedeljko Manojlovic, MD, DSc, MSc

Language of instruction: ENGLISH

ECTS: 3

Prerequisites: none

Semester: **Winter semester, first year**

Course unit objective: Acquisition of basic knowledge and skills in the field of general, inorganic and organic chemistry. Enabling students to understand the chemical aspect of basic physiological and biochemical processes.

Learning outcomes of course unit:

Knowledge about general chemistry. The importance of chemistry as a science.
Knowledge about basic chemical concepts, chemical laws, chemical bonds, intermolecular forces, types of chemical compounds, solutions, chemical analysis, kinetics and equilibrium, buffers, oxido-reduction reactions.
Knowledge about inorganic chemistry and chemistry of bioelements - properties of the elements of the main group of the periodic table of elements, biogenic elements.
Knowledge about organic chemistry - Organic compounds, aliphatic and aromatic organic compounds, aldehydes, ketones, carboxylic acids, heterocyclic compounds, phosphorus, sulfur, nitrogen organic compounds, amino acids, nucleic acids.
Skills of performing experiments, preparing solutions, measuring pH, calculations of concentration, knowledge of buffers, physiological solutions and organic molecules that are important for medicine.

Course unit contents

Theoretical classes

The importance of medical chemistry as a science. General chemistry. Basic chemical concepts, chemical laws, chemical bonds, intermolecular forces, types of chemical compounds, solutions, chemical analysis, kinetics and equilibrium, buffers, oxido-reduction reactions.
Inorganic chemistry and chemistry of bioelements - properties of elements of the main groups of the periodic table of elements, biogenic elements.
Organic chemistry. Organic compounds, aliphatic and aromatic organic compounds, aldehydes, ketones, carboxylic acids, heterocyclic compounds, phosphorus, sulfur, nitrogen organic compounds, amino acids, peptides and proteins, carbohydrates, nucleic acids and lipids.

Practical classes

Laboratory equipment. Preparing of solutions of different concentrations, diluting the solution, measuring pH, calculations of concentration, preparation of buffers and elementary physiological solutions. Chemical characteristics of medical important organic molecules.

Literature

1. *Trifunović S, Sabo T, Todorović Z. General chemistry. Faculty of Chemistry, Belgrade, 2014*
2. *Vollhardt PK, Schore NE. Organic chemistry, structure and function, 7th edition, W.H. Freeman and Company, New York, USA, 2014.*
3. *Bogdanović-Dušanović G, Trajković R, Manojlović N, Milenković-Andjelković A. Practicum in Biochemistry, College of Applied Vocational Studies, Vranje 2011.*

Number of active teaching hours				**Other classes**
Lectures: 15	Practice: 15	Other forms of classes:	Independent work:	
Teaching methods: Lectures, practice in a clinic, clinical problems solving				
Examination methods (maximum 100 points)				
Exam prerequisites	**No. of points:**	**Final exam**		**No. of points:**
Student's activity during lectures	**40**	oral examination		**60**
practical classes/tests		written examination		
Seminars/homework				
Project				
Other				

Grading system		
Grade	**No. of points**	**Description**
10	**91-100**	**Excellent**
9	**81-90**	**Exceptionally good**
8	**71-80**	**Very good**
7	**61-70**	**Good**
6	**51-60**	**Passing**
5	**< 51**	**Failing**