Faculty of Medicine in Rijeka

Curriculum
2024/2025

For course

Chemistry Essentials for Medical Practice

Study program:	**Medical Studies in English (R)** (elective) University integrated undergraduate and graduate study
Department:	**Department of Medical Chemistry, Biochemistry and Clinical Chemistry**
Course coordinator:	**izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije**
Year of study:	**1**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

The aim of this course is to apply the basic chemical concepts to problems pertaining to medical chemistry. Through topics relevant in modern medicine, the understanding and the interconnections of the concepts met in mandatory chemistry courses will be deepened and further integrated into medical studies.

List of assigned reading:

1. R.H. Petrucci, F.G. Herring, J.D. Madura, C. Bissonnette: General Chemistry - Principles and Modern Applications, 10th edition, Pearson Canada Inc., Toronto, Ontario, 2011; McMurry, J.: Fundamentals of Organic Chemistry, 8th Edition, Cengage Learning, 2017;
2. McMurry, J.: Fundamentals of Organic Chemistry, 8th Edition, Cengage Learning, 2017;

List of optional reading:

1. Berg, Tymoczko, Stryer: Biochemistry, 5th edition, NY
2. Any general or medical chemistry textbook.
3. Any biochemistry textbook.

Curriculum:

Seminars list (with titles and explanation):

S1 Introduction.

Describe the purpose and organization of the course. Explain the meaning of conceptual thinking through concrete examples. Define basic concepts in chemistry. Analyze links to medically relevant topics. Justify your choice of the topic for the seminar assignment.

S2 Acid-base equilibrium in the human body. - 1

Explain the relevance of pH in the body. Provide pH values for specific organs, tissues and bodily fluids. Analyze the differences and their purpose.

Describe mechanisms for maintaining acid-base balance. Explain various mechanisms that help regulate acid-base balance in the body.

S3 Acid-base equilibrium in the human body. - 2

Discuss pathological conditions related to acid-base imbalance. Explore health issues resulting from disruptions in acid-base balance.

S5 Complex compounds in the human body.

List the most important complex compounds in the human body. Analyze the types of chemical bonds in them. Relate the structure to the function. Relate the oxidation state of the central metal ion to electronic configuration.

S4 Salts in the human body.

List the most important cations/anions/salts in the human body and diagnostics. Relate the structure of the salts with their biological role. Discuss the influence of the salt hydrolysis on pH balance in a human body.

S6 The relevance of stoichiometry in medicine. - 1

Apply stoichiometry to medically relevant problems.

S7 The relevance of stoichiometry in medicine. - 2

Apply stoichiometry to medically relevant problems.

S8 Simple organic compounds in the body and therapy.

Discuss the structure - property relationship for medically relevant simple organic compounds (hydrocarbons, alcohols, amines, aromatic compounds, carboxylic acids and derivatives).

S9 Non-simple organic compounds in the body and therapy.

Discuss the structure - property relationship for medically relevant non-simple organic compounds (carbohydrates, protein, lipids).

Student obligations:

Regular class attendance and active participation in discussions. Preparing and holding the seminar on the chosen topic.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Active attendance at a minimum of 70 % of classes. Succesfully held seminar on the chosen topic.

Other notes (related to the course) important for students:

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COURSE HOURS 2024/2025

Chemistry Essentials for Medical Practice

Seminars (Place and time or group)

List of lectures, seminars and practicals:

SEMINARS (TOPIC)	Number of hours	Location
S1 Introduction.	2	
S2 Acid-base equilibrium in the human body. - 1	3	
S3 Acid-base equilibrium in the human body. - 2	2	
S5 Complex compounds in the human body.	3	
S4 Salts in the human body.	3	
S6 The relevance of stoichiometry in medicine. - 1	3	
S7 The relevance of stoichiometry in medicine. - 2	3	
S8 Simple organic compounds in the body and therapy.	3	
S9 Non-simple organic compounds in the body and therapy.	3	

EXAM DATES (final exam):