

Medicinski fakultet u Rijeci

## IZVEDBENI NASTAVNI PLAN 2023/2024

Za kolegij

### Medical Chemistry And Biochemistry I

Studij:	<b>Medical Studies in English (R)</b>
	Sveučilišni integrirani prijediplomski i diplomski studij
Katedra:	<b>Katedra za medicinsku kemiju, biokemiju i kliničku kemiju</b>
Nositelj kolegija:	<b>prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing.</b>
Godina studija:	<b>1</b>
ECTS:	<b>8</b>
Stimulativni ECTS:	<b>0 (0.00%)</b>
Strani jezik:	<b>Mogućnost izvođenja na stranom jeziku</b>

## **Podaci o kolegiju:**

### **Course Objectives:**

Acquire knowledge of chemical compounds, both inorganic and organic, that make up living cells or are used to synthesise them, chemical processes involved in their transformations, electrochemical processes, chemical kinetics, and thermochemistry. Acquire the ability to apply this knowledge to biological systems, which is important for understanding human metabolism under both physiological and pathological conditions.

### **Development of general and specific competencies (knowledge and skills):**

Development of an awareness of the similarity and inseparability of chemical reactions in living and nonliving matter, the relationship between structure and reactivity, chemical and energetic transitions, the laws of thermodynamics. Development of the ability to use the acquired knowledge for the understanding of biochemical reactions in human organisms. Expanding knowledge of the relationships between the structure and physical/chemical properties of matter using simple molecules and their application to biomolecules. Solving numerical and logical problems in the field of Medical Chemistry and biochemistry. Development of skills necessary for experimental work, mastery of basic laboratory techniques and methods (chromatography, optical methods, pH measurement). Encouraging students to apply information technology and use the scientific literature. Building a sense of teamwork and developing the ability to think creatively and critically necessary to draw conclusions based on data obtained through analysis. Developing methods and skills necessary for presenting the results obtained.

### **Course correlativity and correspondence:**

The content of the course Medical Chemistry and Biochemistry I correlates with and is complementary to the following courses: Medical Physics and Biophysics, Biochemistry II.

### **Approaches to teaching and learning:**

Lectures, seminars, numerical and laboratory practicals.

## **Popis obvezne ispitne literature:**

B. Blagović and M. Tota (Eds.): Handbook for Seminars and Laboratory Practicals in Medical Chemistry and Biochemistry I, Faculty of Medicine, University of Rijeka, Rijeka, 2019;

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;

McMurry, J.: Fundamentals of Organic Chemistry, 8th Edition, Cengage Learning, 2017;

Murray R.K., Bender D.A., Botham K.M., Kennelly P.J., Rodwell V.W., and Weil P.A. (Eds): Harper's Illustrated Biochemistry, 30th Edition, The McGraw-Hill Companies, 2015

## **Popis dopunske literature:**

Reed, D.: Chemistry for Biologists, Pearson Education Ltd., Harlow, UK, 2013;

McMurry, J., Ballantine, D.S., Hoeger, C.A. and Peterson, V.E.: Fundamentals of General, Organic and Biological Chemistry, 7th Edition, Pearson Education Inc., USA, 2013.

Mahaffy, P., Tasker, R., Bucat, B., Kotz, J.C., Weaver, G.C. and Treichel, P.M.: Chemistry – Human activity, Chemical Reactivity, Nelson Education, USA, 2015.

## **Nastavni plan:**

### **Predavanja popis (s naslovima i pojašnjnjem):**

#### **L1 The Meaning of Chemistry and Biochemistry in the Study of Medicine. Matter**

Explain the classification of matter

#### **L2 Water and Water Solutions**

Provide the basic facts about the quantity, distribution and the role of water in the body. Explain the structure and properties of water. Explain the dissolution of gasses and solid compounds in water.

#### **L3 Solutions of Electrolytes**

Distinguish electrolytes and nonelectrolytes. Explain the properties of solutions of acids, bases, ampholytes and salts

#### **L4 Colligative Properties.**

Define the principle of colligative properties. Explain vapour-pressure lowering, freezing point depression and boiling point elevation.

#### **L5 Colligative Properties. Colloids.**

Explain osmosis and dialysis. Define osmotic pressure. Explain colloids. Name and describe the types and properties of colloids. Explain the difference between the sol and gel state of colloids. Explain the principle of Donnan equilibrium. Describe electrophoresis

#### **L6 Complex Compounds. Complex Salts. Chelates. Biological Chelates. Application of Chelators in Medicine**

Describe the role of chelation in biological systems. Explain the effect of chelators and their use in medicine. Explain the principles of the complexometric method. Relate the structure and properties of apatite minerals (hydroxyapatite, fluorapatite).

#### **L7 Chemical Kinetics. Rate, Order and Molecularity of Reaction**

Define the basic principles of chemical kinetics. Define the rate of reaction and reaction order

#### **L8 Factors Affecting the Rate of Reaction. Catalysis**

Explain how various factors affect the rate of reaction. Describe the mechanism of action of catalysts. Explain the difference between chemical and biochemical catalysts.

#### **L9 Chemical Equilibrium**

Describe the law of mass action and the equilibrium constant. Define Le Chatelier's principle. Explain the impact of external factors on equilibrium

#### **L10 Chemical Equilibrium.**

Define the equilibrium of homogeneous and heterogeneous systems and electrolyte solutions. Define Ostwald's dilution law. Define the solubility product. Describe calcified tissues and the formation of concrements. Distinguish dynamic equilibrium and consistent flow and its importance in biological systems

#### **L11 Equilibrium of Chemical Reactions. Hydrolysis. Buffers.**

Write the equilibrium constant of the chemical reaction. Write and explain hydrolysis constant. Explain the mechanism of buffer action. Write and explain Henderson-Hasselbalch equation.

#### **L12 Thermodynamics. The First Law of Thermodynamics. Thermodynamic Quantities, State Functions of Thermodynamic Systems. Extensive and Intensive Properties.**

Define the basic concepts of thermodynamics and basic thermodynamic quantities. Apply the first law of thermodynamics to biochemical systems.

#### **L13 The Second Law of Thermodynamics. Free (Gibbs) Energy and the Direction of Chemical Reactions. Heat Capacity and Temperature.**

Explain the effect of  $\Delta G$ ,  $\Delta H$ ,  $\Delta S$  values on the spontaneity of reaction. Relate Gibbs' energy with the equilibrium constant

**L14 Electrochemical Reactions. Galvanic Cells. Standard Redox Potential.**

Explain the structure of the galvanic cell. Explain the meaning of standard reduction potential

**L15 Electromotive Force. The Nernst Equation. Biological Redox Systems.**

Write down and explain the Nernst equation. Name biologically important oxidation-reduction systems. Define the standard redox potential of biological systems. Explain Gibbs' energy of redox-systems.

**L16 Structure of Organic Compounds. Types of Reactions in Chemistry of Organic Compounds.**

Classify organic compounds according to functional groups and explain their chemical properties. Define the types of reactions of organic compounds. Explain the concept of nucleophile and electrophile

**L17 Structure of Organic Compounds. Hybridization**

Explain hybridization

**L18 Structure of Organic Compounds. Resonance, Inductive Effect**

Explain resonance and inductive effect.

**L19 Isomerism**

Define isomerism. Explain the types of isomerism (structural, positional, stereoisomerism, geometrical isomerism and conformational isomerism)

**L20 Stereoisomerism: Optical Isomerism.**

Define the chiral molecules. Explain D,L-steric order and R,S-system

**L21 Biologically Important Oxygen Compounds: Alcohols, Phenols and Ethers**

Explain the chemical properties of these classes of compounds and their reactivity. Explain the reactions of oxygen compounds.

**L22 Biologically Important Oxygen Compounds: Aldehydes and Ketones.**

Explain the significance of this group of compounds, their chemical properties and their reactivity.

**L23: Biologically Important Oxygen Compounds: Aldehydes and Ketones.**

Define tautomerism. Explain aldol condensation

**L24 Carbohydrates**

Explain their structure and chemical properties.

**L25 Carbohydrates**

Name and explain the structure of biologically most important monosaccharides, disaccharides and polysaccharides.

**L26 Carboxylic Acids and their Derivatives**

Explain the chemical properties of this class of compounds and their reactivity. Thioesters and acetyl-CoA. Name biologically important mono- and polycarboxylic acids

**L27 Substituted Carboxylic Acids.**

Name the biologically significant representatives. • Explain the structure and preparation of organic derivatives of carbonic acid.

**L28 Lipids: Properties and Classification. Structure and Function of Important Lipid Classes.**

Define lipids and explain their classification. Explain the structure and function of simple lipids.

**L29 Structure and Function of Complex Lipids.**

Explain the structure and function of phospholipids and sphingolipids.

**L30 Structure and Function of Glycolipids. Isoprenoid Compounds.**

Define and explain the classification and structure of glycolipids. Explain the structure and function of steroids and carotenoids.

**L31 Role and Structure of Proteins. Relation Between Protein Structure and Function. Primary Structure**

Describe the structural levels in the architecture of proteins. Define the primary structure

**L32 Conformation of Peptide Chain and Secondary Structure of Proteins. Tertiary Structure. Myoglobin.**

Define the secondary and tertiary structure of proteins. Explain the structure of myoglobin

**L33 Quaternary Protein Structure. Haemoglobin. Mechanism of Oxygen Binding. Allosteric Effect.**

Define the quaternary protein structure. Explain the allosteric properties of haemoglobin.

**L 34 Cooperative Binding. The Bohr Effect.**

Explain cooperativity. Explain Bohr effect.

**L35 Heterocyclic Nitrogen, Oxygen and Sulphur Compounds.**

Define heterocyclic compounds. Name biologically significant representatives

**Vježbe popis (s naslovima i pojašnjnjem):****LP1 General Laboratory Safety Procedures and Rules. Introduction to Qualitative Analysis -Identification of Cations and Anions. Qualitative Inorganic Analysis: Testing Salt Solutions for Anions and Cations**

Basic chemistry lab equipment and techniques.

Detection and identification of different cations and anions in a solution.

Detection and identification of cations and anions in salt solutions

**LP2 : Quantitative Chemical Analysis.**

Name the main types of quantitative chemical analysis.

Describe and exemplify the volumetric methods. Volumetric analysis.

Employ the alkalimetric, manganometric and complexometric methods.

**NP1,2: Solution stoichiometry**

Solve numerical exercises

**NP 3,4 : Chemical Kinetics**

Describe the influence of temperature, concentration, pH and catalyst on the rate of oxidation of oxalic acid with potassium permanganate.

Solve numerical exercises.

**LP3: Buffer Solutions**

Prepare the phosphate buffer solution and measure the pH as well as buffer capacity.

**NP 5,6 : pH and Buffer Solutions.**

Describe the mechanism of buffer action in body fluids.

Calculate the pH value of buffer solutions.

**NP 7,8,9: Redox Reactions**

Define the oxidant and reductant in redox reactions. Balance the redox reactions.

**LP4 : Chemical Kinetics.**

Investigate experimentally the influence of temperature, concentration, pH and catalyst on rate of reaction.

**NP 10 :Aromatic compounds**

Describe the bonding in benzene .Name simple aromatic compound from its structure, or write the structure, given the name. Draw their line-angle structural formulas. .Explain Electrophilic Aromatic Substitution Reactions

#### **LP5 : Qualitative Organic Analysis**

Detect and identify functional groups. Detect and identify amides and purines in solution

#### **LP6 : Optical Methods. Spectrophotometry.**

Determine the wavelength of maximum absorbance. Determine the influence of a concentration on absorbance.

Determine the concentration of CuSO<sub>4</sub> in a solution using a spectrophotometer. Polarimetry. Determine the specific rotation angle of sugar. Make a calibration graph using sugar solutions with different concentrations. Determine the mass concentration of sugar in a sample by measuring the angle of rotation.

#### **LP7 : Qualitative Analysis of Proteins and Amino Acids. Detection and Identification of Different Amino Acids in Various Sample Solutions. Quantitative Determination of Serum Proteins. Isoelectric Point. Thin Layer Chromatography (TLC) of Amino Acids**

Determine the isoelectric point of a given protein solution. Perform a TLC for a given amino acids mixture.

Quantitatively determine the concentration of serum proteins using the Biuret method.

#### **Seminari popis (s naslovima i pojašnjnjem):**

#### **S1,2 Elements and Compounds.**

Explain the structure of atoms, the periodic system and properties of elements that change periodically. List the biogenic elements and define their biological role. Explain the structure and define the properties of compounds.

#### **S3 Chemical Bonds**

Explain and identify chemical bonds

#### **S 4 Intermolecular forces**

Explain and identify intermolecular forces

#### **S5,6 Acids and Bases. Salts.**

Define acids and bases according to Arrhenius, Brønsted and Lewis.

Define salts.

Using charge balance, write the correct formula for an ionic compound.

#### **S7,8 Salts. Hydrolysis.**

Write equation of neutralisation. Balancing a chemical equation. Explain the hydrolysis of salts.

#### **S9,10 Buffers. Mole. Solutions.**

Define buffers and explain the mechanism of buffer action. Define the concept of mole and the concentration of solutions (fractions, molar and mass concentration, molality). Define intensive and extensive properties.

Solution concentrations and reactions.

#### **S11,12 Solution Concentration.**

Define saline solution (physiological solution). Dilution of solutions. Solve the exercises with concentrations.

#### **S13,14 Colligative Properties (Lowering of Vapour Pressure, Elevation of Boiling Point, Depression of Freezing Point and Osmotic Pressure)**

Define colligative properties. Solve exercises relating colligative properties.

#### **S15,16 Equilibrium in the Solutions of Weak Electrolytes. Dissociation Constants of Acids and Bases. The Ionic Product of Water. pH**

Define and write down the dissociation constants of acids and bases. Explain the ionisation of water and define the ionic product of water. Define pH. Define the pH of body fluids.

## **S17,18 Equilibrium in the Solutions of Weak Electrolytes. Numeric Exercises**

Solve exercises using pH, the ionic product of water and dissociation constants.

## **S19,20 Reactions of Organic Compounds**

Describe the characteristic reactions of organic compounds.

## **S21,22 Hydrocarbons**

Classify and name hydrocarbons. Write down the characteristic reactions of hydrocarbons and aromatic compounds

## **S23,24 Alcohols, Ethers, Phenols and Thiols**

Explain the chemical properties and reactivity of these groups of compounds. List biologically important representatives

## **S25 Amines**

Explain the chemical properties and reactivity of this group of compounds. List biologically important representatives.

## **S 26,27,28 Aldehydes and Ketones**

Explain the chemical properties and reactivity of these groups of compounds.

## **S29,30 Monosaccharides and Disaccharides**

List biologically important representatives. Explain the formation of cyclic form. Explain the reactivity of monosaccharides and specify their stereoisomers

## **S31,32 Carboxylic Acids and their Derivatives**

Explain the chemical properties and reactivity of these compounds.

## **S33,34 Substituted Carboxylic Acids**

Name and define substituted carboxylic acids (halogen-, oxo-, hydroxy-, amino acids). Explain their chemical properties.

## **S35,36 Lipids. Fatty Acids.**

Explain the physical properties of lipids. Define fatty acids and name important biological representatives. Explain the chemical properties of fatty acids

## **S37,38 Proteinogenic Amino Acids: Structure, Properties and Reactions.**

Define chemical properties and general reactions. Classify amino acids. Distinguish essential and nonessential amino acids and glucogenic and ketogenic amino acids. Define and calculate the isoelectric point of amino acids

## **S39,40 Peptides. Myoglobin. Haemoglobin.**

Explain the principles of synthesis and determination of sequence. Name the most important natural peptides and explain their role. Recognize levels of proteins. Explain the function of myoglobin and haemoglobin.

## **Obvezne studenata:**

All course announcements and class materials will be made available through the Merlin e-learning system. Classes are organized according to the schedule published in the Merlin e-learning system. Attendance at lectures, seminars, numerical and laboratory practicals and midterm exams is mandatory and is recorded separately for each of these forms and for each student. Classes will begin on time according to the established schedule, and tardiness will be counted as an absence. Entering and leaving the class during the lesson will not be allowed.

A student may be excused for up to 30% of the hours scheduled separately for practicals, seminars, and lectures solely for health reasons that must be excused by a doctor's note (including absences for midterm exams). In case of unexcused absence of more than 30 % of the hours of a specific form of instruction (11 hours of lecture, 13 hours of seminar, 10 hours of practicals), the student cannot continue the course and loses the possibility to take the final examination (0 ECTS points, grade F).

**It is mandatory that absences from laboratory practicals be compensated by an oral colloquium.**

## **Ispit (način polaganja ispita, opis pisanoj/usmenoj/praktičnoj dijelu ispita, način bodovanja, kriterij ocjenjivanja):**

Students may earn a total of 100 credits: a maximum of 70 credits during the semester (three midterm written exams and laboratory practicals) and a maximum of 30 credits on the final exam. Students who have earned at least 35 credits during the semester will be admitted to the final exam. On all written and oral exams, the student must answer at least 50% of the answers correctly. Students who do not score at least 50% on the midterm exams may retake the midterm exams once, during the time of the final exam. Students who are not satisfied with the credits earned may also retake their midterm exams, but only the credits from the repeated midterm exams will be considered.

**SPECIFIC PROVISIONS FOR ONLINE TEACHING:** In accordance with the University of Rijeka's current "Recommendations for Appropriate Conduct in Virtual Systems for the Delivery of Online Instruction and Other Forms of Work in a Virtual Environment" (3.3.2021), certain forms of instruction will be delivered in an online environment in real time according to the published schedule. Lectures, seminars, and practicals will be held on MS Teams, and students should have their camera on for the entire duration of class and a microphone available when interacting. Repeated inability to turn on the camera and/or microphone will be counted as an absence.

**The evaluation of students** is carried out in accordance with the valid study regulations of the University of Rijeka and the Regulation on the Evaluation of Students at the Faculty of Medicine in Rijeka (adopted by the Faculty Council of the Faculty of Medicine in Rijeka). Evaluation of students' progress during classes, midterms and the final exam is shown in the table:

		<b>CREDITS</b>
<b>Midterm exams</b>	I General and inorganic chemistry	16 (x score)
	II Stoichiometry	10 (x score)
	III Organic chemistry and biochemistry I	26 (x score)
	<b>Total</b>	<b>52</b>
<b>Class activity</b>	<b>Total</b>	<b>4</b>
<b>Laboratory practicals</b>	Practicals and reports	<b>14</b>
<b>TOTAL</b>		<b>70</b>
<b>Final exam</b>	Written exam	15 (x score)
	Oral exam	15
	<b>Total</b>	<b>30</b>
<b>TOTAL</b>		<b>100</b>

### **Midterm exams:**

There are three midterm exams during the semester. The first covers the content of bioinorganic, general, and physical chemistry, the second covers stoichiometry, and the third covers organic chemistry and biochemistry (theory, nomenclature, and structural formulas).

### **Class activity:**

There are several ways to earn credits in this category, **(but only) during the semester**. There are several small tests that cover a specific part of the materia. In consultation with the course coordinator, students may also complete a small research paper on a specific topic. Activity and engagement in class as well as special preparation for class are also be rewarded. Students may receive 0.5-1 credit per activity.

### **Laboratory practicals:**

Students may earn a maximum of 14 credits through 7 laboratory practicals. Each completed lab earns **2 credits: 1 for lab work successfully completed and 1 for a completed written report after each practical.** Grades for lab work will be based on the written entrance test (5 short questions; students with 2 or fewer correct answers will not be allowed to attend the practical), activity during the work, and laboratory skills. **A report must be written for each exercise and submitted by the due date.** Any errors must be corrected on resubmission, which will be done with a subsequent report. Only one correction is allowed, and the report is graded thereafter. Grading is based primarily on the quality of the original report (accuracy and neatness), but if corrections are not made appropriately or within a specified time, the report will be graded 0. If more than 30% of the lab work or 30% of the reports are graded 0, or if the total sum of all lab grades is less than 7 (i.e. 50% of the total lab grades), the student will not be allowed to take the final exam. Absence (for any reason) from a laboratory practical must be compensated **by an oral colloquium** within one week of the practical; a successful colloquium earns a total of 0.5 credits. Repetition of the colloquium is not permitted.

**Final exam:** The final examination consists of a written exam (15 credits) and an oral exam (15 credits). Students must pass both parts of the final exam. If students pass the written part of the final exam but not the oral part, they must repeat the written part in the next term of the final exam. There is therefore no transfer of points from the written part to the next exam.

### **Assessment of the oral part of the final exam:**

7.5 – 8 credits: minimum criteria satisfied

9 – 11 credits: average criteria satisfied with noticeable errors

12 – 13 credits: answer with a few errors

14 – 15 credits: outstanding answer.

**The ECTS grading system** is defined by the following criteria:

A (5, excellent) 90-100 credits

B (4, very good) 75-89.99 credits

C (3, good) 60-74.99 credits

D (2, sufficient) 50-59.99 credits

F (1, insufficient, fail) less than 50 credits

### **Ostale napomene (vezane uz kolegij) važne za studente:**

A student who gains less than 35 credits during the pre-exam period, has failed the course.

Communication with professors and assistants: Contact with professors and assistants can be made directly during/after classes, through consultations, by e-mail or via the Merlin platform (Forum or Chat ).

Consultations are held in agreement with professors and assistants at the scheduled time. e-mails:

Course coordinator: Assoc. Prof. Gordana Čanadi Jurešić, [gordanacj@medri.uniri.hr](mailto:gordanacj@medri.uniri.hr)

Collaborators:

Prof. Srećko Valić, [svalic@medri.uniri.hr](mailto:svalic@medri.uniri.hr)

Assoc. prof. Marin Tota, [marin.tota@medri.uniri.hr](mailto:marin.tota@medri.uniri.hr)

Assoc. prof. Lara Batičić, [lara.baticic@medri.uniri.hr](mailto:lara.baticic@medri.uniri.hr)

Assoc. prof. Mirna Petković Didović, [mirnapd@medri.uniri.hr](mailto:mirnapd@medri.uniri.hr)

Assist. prof. Jelena Marinić, [jelena.marinic@medri.uniri.hr](mailto:jelena.marinic@medri.uniri.hr)

Assoc. prof. Damir Klepac, [damir.klepac@medri.uniri.hr](mailto:damir.klepac@medri.uniri.hr)

Iva Vukelić, PhD, [iva.vukelic@medri.uniri.hr](mailto:iva.vukelic@medri.uniri.hr)

Midterm and final exam results, notifications, and all other course information will be posted regularly on the Merlin platform.

## SATNICA IZVOĐENJA NASTAVE 2023/2024

Medical Chemistry And Biochemistry I

Predavanja (mjesto i vrijeme / grupa)	Vježbe (mjesto i vrijeme / grupa)	Seminari (mjesto i vrijeme / grupa)
<b>04.10.2023</b>		
L1 The Meaning of Chemistry and Biochemistry in the Study of Medicine. Matter: • P08 (10:15 - 13:00) [346] ◦ MCAB		S1,2 Elements and Compounds.: • P09 - NASTAVA NA ENGLESKOM JEZIKU (13:15 - 16:00) [349] ◦ MCAB-S2
L2 Water and Water Solutions: • P08 (10:15 - 13:00) [346] ◦ MCAB		S3 Chemical Bonds: • P09 - NASTAVA NA ENGLESKOM JEZIKU (13:15 - 16:00) [349] ◦ MCAB-S2
L3 Solutions of Electrolytes: • P08 (10:15 - 13:00) [346] ◦ MCAB		
izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] · prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]		
<b>05.10.2023</b>		
		S 4 Intermolecular forces: • P09 - NASTAVA NA ENGLESKOM JEZIKU (08:00 - 10:30) [349] ◦ MCAB-S2
		S5,6 Acids and Bases. Salts.: • P09 - NASTAVA NA ENGLESKOM JEZIKU (08:00 - 10:30) [349] ◦ MCAB-S2
		S1,2 Elements and Compounds.: • P09 - NASTAVA NA ENGLESKOM JEZIKU (11:00 - 14:00) [349] ◦ MCAB-S1
		S3 Chemical Bonds: • P09 - NASTAVA NA ENGLESKOM JEZIKU (11:00 - 14:00) [349] ◦ MCAB-S1
izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]		
<b>06.10.2023</b>		
		S 4 Intermolecular forces: • P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 11:00) [349] ◦ MCAB-S1
		S5,6 Acids and Bases. Salts.: • P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 11:00) [349] ◦ MCAB-S1

izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]

### 10.10.2023

		S7,8 Salts. Hydrolysis.: <ul style="list-style-type: none"><li>• P04 (08:15 - 10:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-S2</li></ul></li><li>• P04 (10:15 - 12:00) [349]<ul style="list-style-type: none"><li>◦ MCAB-S1</li></ul></li></ul>
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]

### 11.10.2023

L4 Colligative Properties.: <ul style="list-style-type: none"><li>• P08 (10:15 - 12:00) [348]<ul style="list-style-type: none"><li>◦ MCAB</li></ul></li></ul>		S9,10 Buffers. Mole. Solutions.: <ul style="list-style-type: none"><li>• P07 (12:15 - 14:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-S1</li></ul></li></ul>
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• P08 (10:15 - 12:00) [348]

- MCAB

izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]

### 12.10.2023

	LP1 General Laboratory Safety Procedures and Rules. Introduction to Qualitative Analysis -Identification of Cations and Anions. Qualitative Inorganic Analysis: Testing Salt Solutions for Anions and Cations: <ul style="list-style-type: none"><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (12:15 - 15:00) [351]<ul style="list-style-type: none"><li>◦ MCAB-P1</li></ul></li><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (13:15 - 16:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-P2</li></ul></li></ul>	S9,10 Buffers. Mole. Solutions.: <ul style="list-style-type: none"><li>• P07 (08:15 - 10:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-S2</li></ul></li></ul>
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 13.10.2023

	LP1 General Laboratory Safety Procedures and Rules. Introduction to Qualitative Analysis -Identification of Cations and Anions. Qualitative Inorganic Analysis: Testing Salt Solutions for Anions and Cations: <ul style="list-style-type: none"><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (08:15 - 11:00) [351]<ul style="list-style-type: none"><li>◦ MCAB-P3</li></ul></li></ul>	
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doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 16.10.2023

L6 Complex Compounds. Complex Salts. Chelates. Biological Chelates. Application of Chelators in Medicine: <ul style="list-style-type: none"><li>• P08 (11:15 - 12:00) [344]<ul style="list-style-type: none"><li>◦ MCAB</li></ul></li></ul>		
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prof. dr. sc. Tota Marin, mr. pharm. [344]

### 19.10.2023

		<p><b>S11,12 Solution Concentration.:</b></p> <ul style="list-style-type: none"> <li>• P15 - VIJEĆNICA (08:15 - 10:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (11:15 - 13:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]		
<b>20.10.2023</b>		
		<p><b>S13,14 Colligative Properties (Lowering of Vapour Pressure, Elevation of Boiling Point, Depression of Freezing Point and Osmotic Pressure):</b></p> <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 10:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P04 (08:15 - 10:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
izv. prof. dr. sc. Klepac Damir, dipl. ing. [350] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]		
<b>24.10.2023</b>		
	<p><b>NP1,2: Solution stoichiometry:</b></p> <ul style="list-style-type: none"> <li>• P04 (08:15 - 10:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P04 (10:15 - 12:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>	
izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]		
<b>25.10.2023</b>		
<p>L7 Chemical Kinetics. Rate, Order and Molecularity of Reaction:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L8 Factors Affecting the Rate of Reaction. Catalysis:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>	<p><b>NP 3,4 : Chemical Kinetics:</b></p> <ul style="list-style-type: none"> <li>• P07 (12:15 - 14:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>	
izv. prof. dr. sc. Klepac Damir, dipl. ing. [350]		
<b>26.10.2023</b>		
	<p><b>NP 3,4 : Chemical Kinetics:</b></p> <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 10:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul> <p><b>LP2 : Quantitative Chemical Analysis.:</b></p> <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (12:15 - 15:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-P1</li> </ul> </li> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (13:15 - 16:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-P2</li> </ul> </li> </ul>	

izv. prof. dr. sc. Klepac Damir, dipl. ing. [350] · izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] · doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 27.10.2023

	<p>LP2 : Quantitative Chemical Analysis.: • Katedra za med. kemiju, biokemiju i klin. kemiju (08:15 - 11:00) [351] ◦ MCAB-P3</p>	
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doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 30.10.2023

L9 Chemical Equilibrium:

- P08 (10:15 - 13:00) [345]
  - MCAB

L10 Chemical Equilibrium.:

- P08 (10:15 - 13:00) [345]
  - MCAB

L11 Equilibrium of Chemical

Reactions. Hydrolysis. Buffers.:

- P08 (10:15 - 13:00) [345]
  - MCAB

prof. dr. sc. Valić Srećko, prof. [345]

### 02.11.2023

	<p>S15,16 Equilibrium in the Solutions of Weak Electrolytes. Dissociation Constants of Acids and Bases. The Ionic Product of Water. pH: • P05 (08:15 - 10:00) [350]<ul style="list-style-type: none"><li>◦ MCAB-S2</li></ul> • P05 (11:15 - 13:00) [350]<ul style="list-style-type: none"><li>◦ MCAB-S1</li></ul></p>
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izv. prof. dr. sc. Klepac Damir, dipl. ing. [350]

### 07.11.2023

	<p>NP 5,6 : pH and Buffer Solutions.: • P04 (08:15 - 10:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-S2</li></ul></p>	
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]

### 08.11.2023

<p>L12 Thermodynamics. The First Law of Thermodynamics.</p> <p>Thermodynamic Quantities, State Functions of Thermodynamic Systems. Extensive and Intensive Properties.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L13 The Second Law of Thermodynamics. Free (Gibbs) Energy and the Direction of Chemical Reactions. Heat Capacity and Temperature.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>	<p>NP 5,6 : pH and Buffer Solutions.:</p> <ul style="list-style-type: none"> <li>• P07 (12:15 - 14:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>	
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]

### 09.11.2023

	<p>LP3: Buffer Solutions:</p> <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (13:00 - 15:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-P3</li> </ul> </li> </ul>	<p>S17,18 Equilibrium in the Solutions of Weak Electrolytes. Numeric Exercises:</p> <ul style="list-style-type: none"> <li>• Zavod za anatomiju - Seminarska (08:15 - 10:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P05 (11:15 - 13:00) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
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izv. prof. dr. sc. Klepac Damir, dipl. ing. [350] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 10.11.2023

	<p>LP3: Buffer Solutions:</p> <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (08:00 - 10:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-P1</li> </ul> </li> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (10:00 - 12:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-P2</li> </ul> </li> </ul>	
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349]

### 15.11.2023

<p>L14 Electrochemical Reactions. Galvanic Cells. Standard Redox Potential.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [344] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L15 Electromotive Force. The Nernst Equation. Biological Redox Systems.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [344] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>	<p>NP 7,8,9: Redox Reactions:</p> <ul style="list-style-type: none"> <li>• P07 (12:15 - 15:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>	
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izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] . prof. dr. sc. Tota Marin, mr. pharm. [344]

### 16.11.2023

	<p>NP 7,8,9: Redox Reactions:</p> <ul style="list-style-type: none"> <li>• P07 (08:00 - 10:30) [350] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul>	
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**17.11.2023**

	<p>LP4 : Chemical Kinetics.:</p> <ul style="list-style-type: none"><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (08:00 - 10:00) [348]<ul style="list-style-type: none"><li>◦ MCAB-P3</li></ul></li><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (10:00 - 12:00) [351]<ul style="list-style-type: none"><li>◦ MCAB-P2</li></ul></li><li>• Katedra za med. kemiju, biokemiju i klin. kemiju (12:00 - 14:00) [351]<ul style="list-style-type: none"><li>◦ MCAB-P1</li></ul></li></ul>	
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] · doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

**22.11.2023**

L16 Structure of Organic Compounds. Types of Reactions in Chemistry of Organic Compounds.: <ul style="list-style-type: none"><li>• P08 (10:15 - 13:00) [348]<ul style="list-style-type: none"><li>◦ MCAB</li></ul></li></ul>		
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L17 Structure of Organic Compounds. Hybridization:

- P08 (10:15 - 13:00) [348]
  - MCAB

L18 Structure of Organic Compounds. Resonance, Inductive Effect:

- P08 (10:15 - 13:00) [348]
  - MCAB

izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]

**29.11.2023**

L19 Isomerism: <ul style="list-style-type: none"><li>• P08 (10:15 - 12:00) [346]<ul style="list-style-type: none"><li>◦ MCAB</li></ul></li></ul>		
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L20 Stereoisomerism: Optical Isomerism.:

- P08 (10:15 - 12:00) [346]
  - MCAB

S19,20 Reactions of Organic Compounds:

- P09 - NASTAVA NA ENGLESKOM JEZIKU (12:15 - 14:00) [348]
  - MCAB-S2
  - MCAB

izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] · prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**30.11.2023**

	<p>S21,22 Hydrocarbons:</p> <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 10:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P01 (15:15 - 17:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> <li>◦ MCAB</li> </ul> </li> </ul> <p>S19,20 Reactions of Organic Compounds:</p> <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (11:15 - 13:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]

### 06.12.2023

L21 Biologically Important Oxygen Compounds: Alcohols, Phenols and Ethers:

- P08 (10:15 - 13:00) [346]
  - MCAB

L22 Biologically Important Oxygen Compounds: Aldehydes and Ketones.:

- P08 (10:15 - 13:00) [346]
  - MCAB

L23: Biologically Important Oxygen Compounds: Aldehydes and Ketones.:

- P08 (10:15 - 13:00) [346]
  - MCAB

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

### 07.12.2023

LP5 : Qualitative Organic Analysis:

- Katedra za med. kemiju, biokemiju i klin. kemiju (13:00 - 16:00) [351][349]
  - MCAB-P2
  - MCAB-P1

S23,24 Alcohols, Ethers, Phenols and Thiols:

- P06 (08:15 - 10:00) [350]
  - MCAB-S2
- P06 (10:45 - 12:30) [350]
  - MCAB-S1

izv. prof. dr. sc. Klepac Damir, dipl. ing. [350] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### 08.12.2023

LP5 : Qualitative Organic Analysis:

- Katedra za med. kemiju, biokemiju i klin. kemiju (08:00 - 11:00) [351]
  - MCAB-P3

NP 10 :Aromatic compounds:

- P06 (09:00 - 10:00) [346]
  - MCAB-S1
- P06 (12:00 - 13:00) [346]
  - MCAB-S2

S25 Amines:

- P06 (08:15 - 09:00) [346]
  - MCAB-S1
- P06 (10:15 - 11:00) [346]
  - MCAB-S2

doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351] . prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**13.12.2023****L24 Carbohydrates:**

- P08 (10:15 - 13:00) [346]
  - MCAB

**L25 Carbohydrates:**

- P08 (10:15 - 13:00) [346]
  - MCAB

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**14.12.2023****S 26,27,28 Aldehydes and Ketones:**

- P04 (13:15 - 16:00) [346]
  - MCAB-S2

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**15.12.2023****S 26,27,28 Aldehydes and Ketones:**

- P04 (08:15 - 11:00) [346]
  - MCAB
  - MCAB-S1

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**18.12.2023****S29,30 Monosaccharides and Disaccharides:**

- P09 - NASTAVA NA ENGLESKOM JEZIKU (14:15 - 16:00) [346]
  - MCAB-S1

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**19.12.2023****S29,30 Monosaccharides and Disaccharides:**

- P04 (14:15 - 16:00) [346]
  - MCAB-S2

prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

**20.12.2023****L26 Carboxylic Acids and their Derivatives:**

- P08 (10:15 - 12:00) [348]
  - MCAB

**L27 Substituted Carboxylic Acids.:**

- P08 (10:15 - 12:00) [348]
  - MCAB

izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]

**21.12.2023**

		<p>S31,32 Carboxylic Acids and their Derivatives:</p> <ul style="list-style-type: none"> <li>• P06 (08:15 - 10:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> <li>• P06 (11:15 - 13:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]		
<b>09.01.2024</b>		
		<p>S33,34 Substituted Carboxylic Acids:</p> <ul style="list-style-type: none"> <li>• P05 (14:15 - 16:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348]		
<b>10.01.2024</b>		
<p>L28 Lipids: Properties and Classification. Structure and Function of Important Lipid Classes.:</p> <ul style="list-style-type: none"> <li>• P08 (08:15 - 11:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L29 Structure and Function of Complex Lipids.:</p> <ul style="list-style-type: none"> <li>• P08 (08:15 - 11:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L30 Structure and Function of Glycolipids. Isoprenoid Compounds.:</p> <ul style="list-style-type: none"> <li>• P08 (08:15 - 11:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>		<p>S35,36 Lipids. Fatty Acids.:</p> <ul style="list-style-type: none"> <li>• P07 (12:15 - 14:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul>
prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]		
<b>11.01.2024</b>		
	<p>LP6 : Optical Methods. Spectrophotometry.:</p> <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (12:00 - 16:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-P1</li> </ul> </li> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (13:00 - 17:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-P2</li> </ul> </li> </ul>	<p>S33,34 Substituted Carboxylic Acids:</p> <ul style="list-style-type: none"> <li>• P03 - INFORMATIČKA UČIONICA (08:00 - 10:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul>
izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]		
<b>12.01.2024</b>		
	<p>LP6 : Optical Methods. Spectrophotometry.:</p> <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (08:00 - 12:00) [349] <ul style="list-style-type: none"> <li>◦ MCAB-P3</li> </ul> </li> </ul>	<p>S35,36 Lipids. Fatty Acids.:</p> <ul style="list-style-type: none"> <li>• P07 (08:15 - 10:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] . prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]		
<b>15.01.2024</b>		

		S37,38 Proteinogenic Amino Acids: Structure, Properties and Reactions.: <ul style="list-style-type: none"> <li>• P07 (12:15 - 14:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
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prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

#### 17.01.2024

L31 Role and Structure of Proteins. Relation Between Protein Structure and Function. Primary Structure: <ul style="list-style-type: none"> <li>• P08 (10:15 - 12:00) [518] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>		S37,38 Proteinogenic Amino Acids: Structure, Properties and Reactions.: <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 10:00) [346] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul>
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doc. dr. sc. Marinić Jelena, dipl. ing. [518] . prof. dr. sc. Čanadi Jurešić Gordana, dipl. ing. [346]

#### 18.01.2024

	LP7 : Qualitative Analysis of Proteins and Amino Acids. Detection and Identification of Different Amino Acids in Various Sample Solutions. Quantitative Determination of Serum Proteins. Isoelectric Point. Thin Layer Chromatography (TLC) of Amino Acids: <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (12:00 - 15:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-P1</li> </ul> </li> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (13:00 - 16:00) [348] <ul style="list-style-type: none"> <li>◦ MCAB-P2</li> </ul> </li> </ul>	
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izv. prof. dr. sc. Batičić Lara, dipl. sanit. ing. [348] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

#### 19.01.2024

	LP7 : Qualitative Analysis of Proteins and Amino Acids. Detection and Identification of Different Amino Acids in Various Sample Solutions. Quantitative Determination of Serum Proteins. Isoelectric Point. Thin Layer Chromatography (TLC) of Amino Acids: <ul style="list-style-type: none"> <li>• Katedra za med. kemiju, biokemiju i klin. kemiju (08:00 - 11:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-P3</li> </ul> </li> </ul>	
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doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

#### 22.01.2024

		S39,40 Peptides. Myoglobin. Haemoglobin.: <ul style="list-style-type: none"> <li>• P08 (12:15 - 14:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-S1</li> </ul> </li> </ul>
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doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

#### 24.01.2024

<p>L33 Quaternary Protein Structure. Haemoglobin. Mechanism of Oxygen Binding. Allosteric Effect.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 13:00) [518] [349] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L 34 Cooperative Binding. The Bohr Effect.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 13:00) [518] [349] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul> <p>L35 Heterocyclic Nitrogen, Oxygen and Sulphur Compounds.:</p> <ul style="list-style-type: none"> <li>• P08 (10:15 - 13:00) [518] [349] <ul style="list-style-type: none"> <li>◦ MCAB</li> </ul> </li> </ul>		<p>S39,40 Peptides. Myoglobin. Haemoglobin.:</p> <ul style="list-style-type: none"> <li>• P09 - NASTAVA NA ENGLESKOM JEZIKU (08:15 - 10:00) [351] <ul style="list-style-type: none"> <li>◦ MCAB-S2</li> </ul> </li> </ul>
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doc. dr. sc. Marinić Jelena, dipl. ing. [518] . izv. prof. dr. sc. Petković Didović Mirna, dipl. ing. kemije [349] . doc. dr. sc. Vukelić Iva, dipl. sanit. ing. [351]

### **Popis predavanja, seminara i vježbi:**

PREDAVANJA (TEMA)	Broj sati	Mjesto održavanja
L1 The Meaning of Chemistry and Biochemistry in the Study of Medicine. Matter	1	P08
L2 Water and Water Solutions	1	P08
L3 Solutions of Electrolytes	1	P08
L4 Colligative Properties.	1	P08
L5 Colligative Properties. Colloids.	1	P08
L6 Complex Compounds. Complex Salts. Chelates. Biological Chelates. Application of Chelators in Medicine	1	P08
L7 Chemical Kinetics. Rate, Order and Molecularity of Reaction	1	P08
L8 Factors Affecting the Rate of Reaction. Catalysis	1	P08
L9 Chemical Equilibrium	1	P08
L10 Chemical Equilibrium.	1	P08
L11 Equilibrium of Chemical Reactions. Hydrolysis. Buffers.	1	P08
L12 Thermodynamics. The First Law of Thermodynamics. Thermodynamic Quantities, State Functions of Thermodynamic Systems. Extensive and Intensive Properties.	1	P08
L13 The Second Law of Thermodynamics. Free (Gibbs) Energy and the Direction of Chemical Reactions. Heat Capacity and Temperature.	1	P08
L14 Electrochemical Reactions. Galvanic Cells. Standard Redox Potential.	1	P08
L15 Electromotive Force. The Nernst Equation. Biological Redox Systems.	1	P08
L16 Structure of Organic Compounds. Types of Reactions in Chemistry of Organic Compounds.	1	P08
L17 Structure of Organic Compounds. Hybridization	1	P08
L18 Structure of Organic Compounds. Resonance, Inductive Effect	1	P08
L19 Isomerism	1	P08
L20 Stereoisomerism: Optical Isomerism.	1	P08
L21 Biologically Important Oxygen Compounds: Alcohols, Phenols and Ethers	1	P08

L22 Biologically Important Oxygen Compounds: Aldehydes and Ketones.	1	P08
L23: Biologically Important Oxygen Compounds: Aldehydes and Ketones.	1	P08
L24 Carbohydrates	1	P08
L25 Carbohydrates	1	P08
L26 Carboxylic Acids and their Derivatives	1	P08
L27 Substituted Carboxylic Acids.	1	P08
L28 Lipids: Properties and Classification. Structure and Function of Important Lipid Classes.	1	P08
L29 Structure and Function of Complex Lipids.	1	P08
L30 Structure and Function of Glycolipids. Isoprenoid Compounds.	1	P08
L31 Role and Structure of Proteins. Relation Between Protein Structure and Function. Primary Structure	1	P08
L32 Conformation of Peptide Chain and Secondary Structure of Proteins. Tertiary Structure. Myoglobin.	1	P08
L33 Quaternary Protein Structure. Haemoglobin. Mechanism of Oxygen Binding. Allosteric Effect.	1	P08
L 34 Cooperative Binding. The Bohr Effect.	1	P08
L35 Heterocyclic Nitrogen, Oxygen and Sulphur Compounds.	1	P08

VJEŽBE (TEMA)	Broj sati	Mjesto održavanja
LP1 General Laboratory Safety Procedures and Rules. Introduction to Qualitative Analysis -Identification of Cations and Anions. Qualitative Inorganic Analysis: Testing Salt Solutions for Anions and Cations	3	Katedra za med. kemiju, biokemiju i klin. kemiju
LP2 : Quantitative Chemical Analysis.	3	Katedra za med. kemiju, biokemiju i klin. kemiju
NP1,2: Solution stoichiometry	2	P04
NP 3,4 : Chemical Kinetics	2	P07 P09 - NASTAVA NA ENGLESKOM JEZIKU
LP3: Buffer Solutions	2	Katedra za med. kemiju, biokemiju i klin. kemiju
NP 5,6 : pH and Buffer Solutions.	2	P04 P07
NP 7,8,9: Redox Reactions	3	P07
LP4 : Chemical Kinetics.	2	Katedra za med. kemiju, biokemiju i klin. kemiju
NP 10 :Aromatic compounds	1	P06
LP5 : Qualitative Organic Analysis	3	Katedra za med. kemiju, biokemiju i klin. kemiju
LP6 : Optical Methods. Spectrophotometry.	4	Katedra za med. kemiju, biokemiju i klin. kemiju
LP7 : Qualitative Analysis of Proteins and Amino Acids. Detection and Identification of Different Amino Acids in Various Sample Solutions. Quantitative Determination of Serum Proteins. Isoelectric Point. Thin Layer Chromatography (TLC) of Amino Acids	3	Katedra za med. kemiju, biokemiju i klin. kemiju

SEMINARI (TEMA)	Broj sati	Mjesto održavanja
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S1,2 Elements and Compounds.	2	P09 - NASTAVA NA ENGLESKOM JEZIKU
S3 Chemical Bonds	1	P09 - NASTAVA NA ENGLESKOM JEZIKU
S 4 Intermolecular forces	1	P09 - NASTAVA NA ENGLESKOM JEZIKU
S5,6 Acids and Bases. Salts.	2	P09 - NASTAVA NA ENGLESKOM JEZIKU
S7,8 Salts. Hydrolysis.	2	P04
S9,10 Buffers. Mole. Solutions.	2	P07
S11,12 Solution Concentration.	2	P09 - NASTAVA NA ENGLESKOM JEZIKU P15 - VIJEĆNICA
S13,14 Colligative Properties (Lowering of Vapour Pressure, Elevation of Boiling Point, Depression of Freezing Point and Osmotic Pressure)	2	P04 P09 - NASTAVA NA ENGLESKOM JEZIKU
S15,16 Equilibrium in the Solutions of Weak Electrolytes. Dissociation Constants of Acids and Bases. The Ionic Product of Water. pH	2	P05
S17,18 Equilibrium in the Solutions of Weak Electrolytes. Numeric Exercises	2	P05 Zavod za anatomiju - Seminarska
S19,20 Reactions of Organic Compounds	2	P09 - NASTAVA NA ENGLESKOM JEZIKU
S21,22 Hydrocarbons	2	P01 P09 - NASTAVA NA ENGLESKOM JEZIKU
S23,24 Alcohols, Ethers, Phenols and Thiols	2	P06
S25 Amines	1	P06
S 26,27,28 Aldehydes and Ketones	3	P04
S29,30 Monosaccharides and Disaccharides	2	P04 P09 - NASTAVA NA ENGLESKOM JEZIKU
S31,32 Carboxylic Acids and their Derivatives	2	P06
S33,34 Substituted Carboxylic Acids	2	P03 - INFORMATIČKA UČIONICA P05
S35,36 Lipids. Fatty Acids.	2	P07
S37,38 Proteinogenic Amino Acids: Structure, Properties and Reactions.	2	P07 P09 - NASTAVA NA ENGLESKOM JEZIKU
S39,40 Peptides. Myoglobin. Haemoglobin.	2	P08 P09 - NASTAVA NA ENGLESKOM JEZIKU

**ISPITNI TERMINI (završni ispit):**

1.	07.02.2024.
2.	21.02.2024.
3.	08.07.2024.
4.	04.09.2024.
5.	18.09.2024.