



<b>Course ID: HBOII2</b>		<b>Course name: BIOCHEMISTRY WITH CLINICAL CORRELATIONS</b>	
<b>Cycle: SECOND</b>	<b>Year: FIRST</b>	<b>Semester: I</b>	<b>ECTS credits: 6</b>
<b>Course status: ELECTIVE</b>		<b>Total course hours: 90</b> Lectures: 45 Laboratory: 45	
<b>Teaching participants:</b>	<b>Teachers and associates with expertise in the field of biochemistry and clinical biochemistry</b>		
<b>Prerequisite for enrollment:</b>	-		
<b>Course aims:</b>	Acquaintance of students with the meaning of general and specific clinical-biochemical tests in prevention, diagnosis, monitoring and prognosis, as well as the success of treatment of various organs and organ systems.		
<b>Thematic course units:</b>	<ol style="list-style-type: none"><li>1. Sodium and water metabolism. Clinical meaning of sodium concentration in plasma. Potassium metabolism. Measurement of renal and gastrointestinal potassium loss. Clinical picture of potassium metabolism disorders. Biochemical investigations of kidney function disorders, and homeostasis of water and electrolytes. Disorders of acid-base balance. Blood gas concentration.</li><li>2. Hypothalamus and pituitary gland. Adrenal cortex. Reproduction system. Investigation of pituitary, adrenal and sex (gonadal) gland dysfunction.</li><li>3. Thyroid function.</li><li>4. Calcium, phosphate and magnesium metabolism. Examination of calcium metabolism disorders.</li><li>5. Hormonal regulation of metabolism.</li><li>6. Hormone action:<ol style="list-style-type: none"><li>a) Activation of the adenylate-cyclase system</li><li>b) Control and induction of gene activity.</li></ol></li><li>7. Patobiochemistry and meaning in diagnostics.</li><li>8. Carbohydrate metabolism and its relationships to the metabolism of other substances.</li><li>9. Lipids and lipoproteins in plasma.</li><li>10. Absorption in the digestive tract: function of the stomach and pancreas.</li><li>11. Liver diseases and gallstones.</li><li>12. Enzymes. Enzyme pathobiochemistry and significance in diagnostics.</li><li>13. Proteins in plasma and urine.</li><li>14. Clinical chemistry of the newborn.</li><li>15. Purine and urate metabolism.</li><li>16. Iron metabolism. Examination of iron metabolism disorders.</li><li>17. Porphyry.</li><li>18. Biochemical effects of tumors.</li></ol>		

	<p>19. Cerebrospinal fluid (CSF). 20. Control of drug concentration.</p>																											
<b>Learning outcomes:</b>	<p><i>Knowledge:</i> The student will learn about the clinical significance of concentrations of minerals, hormones, vitamins, lipids and lipoproteins, enzymes and other proteins, carbohydrates and other biomolecules in blood plasma and/or other body fluids. Also, they will gain knowledge about the causes and consequences of acid-base balance, about the mechanism of action of the three-member axis pituitary-hypothalamus-adrenal cortex, about the function of the thyroid, stomach, pancreas, and liver. The student will learn about the clinical chemistry of the newborn, and about the biochemical effects of tumor.</p> <p><i>Skills:</i> The student will be able to understand the clinical meaning of concentrations of minerals, hormones, vitamins, lipids and lipoproteins, enzymes and other proteins, carbohydrates and other biomolecules in blood plasma and/or other body fluids. Also, they will acquire skills on recognizing the causes and consequences of acid-base balance, on the relationship between the action of the three-member axis pituitary-hypothalamus-adrenal cortex and work of vital organs and tissues.</p> <p><i>Competences:</i> The student will have the competence to independently judge the clinical importance of water and electrolytes balance, acid-base balance, to discuss the mutual influence of concentrations of minerals, hormones, vitamins, lipids and lipoproteins, enzymes and other proteins, carbohydrates and other biomolecules in blood plasma on functioning pituitary-hypothalamus-adrenal gland system. Also, the student will be competent to present the function of the kidney, thyroid, stomach, pancreas, liver, and other organs in the context of maintaining the normal homeostasis of the entire organism.</p>																											
<b>Teaching methodology:</b>	Classroom lectures and laboratory exercises.																											
<b>Assessment methods and grading system<sup>1</sup>:</b>	<table border="1"> <thead> <tr> <th colspan="3">Grading criteria</th> </tr> <tr> <th>Criteria</th> <th>Maximal score</th> <th>Required score</th> </tr> </thead> <tbody> <tr> <td>1. Class attendance</td> <td>5</td> <td>3</td> </tr> <tr> <td>2. Class activities</td> <td>10</td> <td>5</td> </tr> <tr> <td>3. Midterms</td> <td>45</td> <td>25</td> </tr> <tr> <td>4. Final exam</td> <td>40</td> <td>22</td> </tr> <tr> <td>Total</td> <td>100</td> <td>55</td> </tr> <tr> <th colspan="3">Scores and grading</th> </tr> <tr> <td>Score</td> <td>Grade</td> <td>Grade</td> </tr> </tbody> </table>	Grading criteria			Criteria	Maximal score	Required score	1. Class attendance	5	3	2. Class activities	10	5	3. Midterms	45	25	4. Final exam	40	22	Total	100	55	Scores and grading			Score	Grade	Grade
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<sup>1</sup> The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

	(B&H)	(ECTS)
< 55	5	F, FX
55–64	6	E
65–74	7	D
75–84	8	C
85–94	9	B
95–100	10	A

  

<b>Literature<sup>2</sup>:</b>	<p><i>Mandatory literature:</i></p> <ol style="list-style-type: none"> <li>1. Berg, J.M., Tymoczko, J.L., Stryer, L. (2002) BIOCHEMISTRY, 5<sup>th</sup> ed. W.H. Freeman &amp; Co., New York</li> <li>2. Voet, D., Voet, J.G. (2004) BIOCHEMISTRY, 3<sup>rd</sup> ed. J. Wiley &amp; Sons, New York.</li> <li>3. Zilva, F., Pannall, R., Mayne, D. (1992), Klinička kemija u dijagnostici i terapiji“, 3<sup>rd</sup> revised edition; translated: Marijana Fišer-Herman Zagreb: „Školska knjiga“.</li> </ol>
	<p><i>Supplementary literature:</i></p> <ol style="list-style-type: none"> <li>1. Boyer, R. (2002) CONCEPTS OF BIOCHEMISTRY, 2<sup>nd</sup> ed. J. Wiley &amp; Sons, New York, Chichester, Weinheim, Brisbane, Singapore, Toronto.</li> <li>2. Devlin, T.M. (1997) TEXTBOOK OF BIOCHEMISTRY WITH CLINICAL CORRELATIONS, 4<sup>th</sup>ed., Wiley-Liss, New York,... Brisbane,... Toronto.</li> </ol>

<sup>2</sup> The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton