| **Course ID: HOB351** | **Course name: BIOCHEMISTRY I** | | |
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| **Cycle: FIRST** | **Year: THIRD** | **Semester: V** | **ECTS credits: 5** |
| **Course status: MANDATORY** | | **Total course hours: 75**<br>Lectures: 30<br>Laboratory: 45 | |
| **Teaching participants:** | **Teachers and associates with expertise in the field of biochemistry** | | |
| **Prerequisite for enrollment:** | - | | |
| **Course aims:** | Introducing students to the basics of biochemistry, the chemical structure of living cells, as well as its dynamic functions. Acquiring knowledge about a living system at the molecular level with the help of the results of static and dynamic biochemistry. Give the students a detailed overview of the importance of the relationship between the structure and function of biomolecules. | | |
| **Thematic course units:** | 1. Structure and biological function of carbohydrates (mono-, oligo- and polysaccharides);<br>2. Single and complex lipids; Membrane lipids - structure and dynamic of biological membranes;<br>3. Structure and native conformation of proteins; Determination of primary and three-dimensional structure of proteins;<br>4. Automated synthesis of proteins; Enzymes; Efficacy and specificity of the enzymes.<br>5. Change of free energy and equilibrium. Active enzyme site and enzyme-substrate complex. Enzyme reaction kinetics (Michaelis-Menten model and allosteric enzymes);<br>6. Influence of inhibitors on enzyme reaction kinetics;<br>7. Mechanisms of enzyme action;<br>8. Control of enzyme activity;<br>9. Nucleic acids: structure and function;<br>10. Nucleoproteids: structure and function;<br>11. Bioregulators, modulators and signaling substances;<br>12. Hormones-chemical classification;<br>13. Vitamines and coenzymes. | | |
| **Learning outcomes:** | *Knowledge:* The student will learn the basic structural characteristics and roles of major biopolymers and other biomolecules. Also, the students will master the basic principles of determining all levels of protein structures, ways to control enzyme activity and mechanisms of their action, basic settings of bioregulators, modulators and signaling substances. | | |

<table>
<tr><td></td><td>Skills: The student will be able to recognize the most important structural details of the main biopolymers and other biomolecules, as well as to correlate their structure and activity.<br>Competencies: The student will have the competence to independently judge the most important structural characteristics and roles of major biopolymers and other biomolecules, as well as to connect their structural patterns with functions.</td></tr>
<tr><td>Teaching methodology:</td><td>Classroom lectures and laboratory exercises.</td></tr>
<tr><td>Assessment methods and grading system[1]:</td><td>
<table>
<tr><td colspan="3">Grading criteria</td></tr>
<tr><td>Criteria</td><td>Maximal score</td><td>Required score</td></tr>
<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><td colspan="3">Scores and grading</td></tr>
<tr><td>Score</td><td>Grade (B&H)</td><td>Grade (ECTS)</td></tr>
<tr><td>< 55</td><td>5</td><td>F, FX</td></tr>
<tr><td>55–64</td><td>6</td><td>E</td></tr>
<tr><td>65–74</td><td>7</td><td>D</td></tr>
<tr><td>75–84</td><td>8</td><td>C</td></tr>
<tr><td>85–94</td><td>9</td><td>B</td></tr>
<tr><td>95–100</td><td>10</td><td>A</td></tr>
</table>
</td></tr>
<tr><td>Literature[2]:</td><td>Mandatory literature:<br>1. Berg JM, Tymoczko JL, Stryer L (2002) BIOCHEMISTRY, 5th ed. W.H. Freeman & Co., New York<br>2. Voet D, Voet JG (2004) BIOCHEMISTRY, 3rd ed. J. Wiley & Sons, New York<br>3. Tahirović I, Topčagić A (2012) PRAKTIKUM IZ BIOHEMIJE I, PMF, Sarajevo<br>Supplementary literature:<br>1. Nelson DL, Cox MM (2013) LEHNINGER PRINCIPLES OF BIOCHEMISTRY, 6th ed. Worth Publishers, New York.<br>2. Boyer R (2002) CONCEPTS OF BIOCHEMISTRY, 2nd ed. J. Wiley & Sons, New York, Chichester, Weinheim, Brisbane, Singapore, Toronto.<br>3. Authorized lectures.<br>4. Ašimović Z., (2017) Osnovi biohemije, Univerzitet u Sarajevu,</td></tr>
</table>

[1] 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

[2] 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

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| | Poljoprivredno-prehrambeni fakultet.<br>5. Tahirović I, Topčagić A, Buza N (2018) ZBIRKA ZADATAKA IZ BIOHEMIJE I, PMF, Sarajevo. |