

## COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	BSc.
Specialization/ diploma path								Study profile	Academic profile
Course name	Biochemistry							Course code	IS-FCEE-00021S
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	Summer
	15		30					No. of ECTS credits	4
Entry requirements	Chemistry								
Course objectives	<ul style="list-style-type: none"> <li>- presenting the principles of safe work in the biochemical laboratory</li> <li>- acquaint students with the concepts of biochemistry of nucleic acids and proteins and methods of their extraction from biological material, purification and quantitative and qualitative determination</li> <li>- presenting the methods of testing the basic properties of sugars, lipids and vitamins and determining them in biological material</li> <li>- preparation for conducting scientific research</li> </ul>								
Course content	<p><b>Lectures.</b> Structure of nucleic acids. Metabolism of nucleotide compounds, pyrimidines and purines. DNA - spatial model. Organization of genome, nucleoproteins. RNP isolation. Types of RNA and their structure. General rules for the isolation of nucleic acids. Structure and physicochemical and biological properties of proteins. Qualitative and quantitative determination of proteins. Proteome and proteomics. Simple and complex carbohydrates.</p> <p><b>Laboratory.</b> Principles of work in the biochemical laboratory. Extraction, secretion and purification of crude RNA from biological material. Isolating ribonucleoproteins from animal tissues. Proteins as colloids. Solubility and protein shedding. Protein denaturation. Quantitative determination of protein content by the Lowry method, the method of measuring ultraviolet absorbance and the Bradford method in various biological samples. Electrophoretic separation of proteins from various biological samples by vertical polyacrylamide gel electrophoresis. Reduction properties of carbohydrates. Hydrolysis of multi-sugars. Basic physicochemical properties of lipids. Determination of vitamin C in biological material.</p>								
Teaching methods	Lecture, laboratory classes								
Assessment method	Lecture - written exam, laboratory - colloquia, laboratory tests								
Symbol of	Learning outcomes							Reference to the	

learning outcome		learning outcomes for the field of study	
L01	The student knows the advanced biochemistry issues necessary to understand and quantify the processes and phenomena; using nature laws in biotechnology in the field of the completed specialty	BT1_W02	
L02	The student knows in an advanced degree phenomena in the field of techniques and methods of isolation, purification and identification of chemical and biochemical preparations	BT1_W03	
L03	The student knows the advanced issues related to modeling and simulation of biochemical reactions occurring in biotechnological processes	BT1_W07	
L04	The student can apply basic analytical techniques in the field of biochemistry	BT1_U06	
L05	The student is able to isolate and acquire simple raw materials or biotechnological products from biological material	BT1_U08	
L06			
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	Written exam	L	
L02	Colloquium	LC	
L03	Colloquium	LC	
L04	Colloquium	LC	
L05	Written exam, colloquium	L, LC	
L06			
Student workload (in hours)		No. of hours	
Calculation	Participation in lectures	15	
	Participation in laboratory classes	30	
	Preparation for the written exam in lectures	30	
	Preparation for laboratory tests	30	
	Preparation for and attendance at the examination	20	
	Participation in consultations	5	
	TOTAL:	130	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		52	2
Student workload – practical activities		115	4,5
Basic references	1. Andreas Hofmann, Samuel Clokie, Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press 2018 2. John W. Baynes & Marek H. Dominiczak, Medical Biochemistry, 5th Edition.		

	<p><b>Elsevier 2018</b></p> <p><b>3. Mary K. Campbell/Shawn O. Farrell/Owen M. McDougal Biochemistry 9th Edition, Cengage Learning, 2017</b></p>	
<b>Supplementary references</b>	<p>1. David Hames, Nigel Hooper. BIOS Instant Notes in Biochemistry. Taylor &amp; Francis 2011.</p>	
<b>Organisational unit conducting the course</b>	<b>Department of Chemistry, Biology and Biotechnology</b>	<b>Date of issuing the programme</b>
<b>Author of the programme</b>	<b>Dr Agata Jabłońska-Trypuć</b>	<b>05.03.2021</b>

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar