

DESCRIPTION OF THE COURSE OF STUDY

Course code	0511-2BIO-BC05-B	
Name of the course in	Polish	Biochemia
	English	Biochemistry

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	Biology
1.2. Mode of study	Full time study
1.3. Level of study	Bachelor
1.4. Profile of study*	
1.5. Person/s preparing the course description	Dr hab. Karol Ciepluch, Dr hab. Bożena Witek
1.6. Contact	karol.ciepluch@ujk.edu.pl , bozena.witek@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	english
2.2. Prerequisites*	Organic and inorganic chemistry

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	lectures, classes	
3.2. Place of classes	WNSiP, Institut of Biology	
3.3. Form of assessment	exam	
3.4. Teaching methods	Presentation lectures, laboratory courses	
3.5. Bibliography	Required reading	Biochemistry (Harper) Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil
	Further reading	

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

<p>4.1. Course objectives (including form of classes)</p> <p><i>C1. Knowledge of the structure and properties of the basic classes of chemical compounds found in living organisms.</i></p> <p><i>C2. Knowledge of the physicochemical basics of enzymatic catalysis and the processes of capturing and converting energy in metabolic transformations.</i></p> <p><i>C3. Knowledge of basic catabolic and anabolic processes in cells and the integration and regulation of metabolic processes.</i></p> <p><i>C4. The ability to use biochemical knowledge, in particular about the metabolism of nucleic acids and proteins, in the fields of biology used.</i></p>
<p>4.2. Detailed syllabus (including form of classes)</p> <p><i>1. Basic classes of biological compounds and typical biochemical reactions.</i></p> <p><i>2. Basic macromolecules in cells and tissues. Amino acids, proteins, carbohydrates, lipids and nucleic acids and their properties.</i></p> <p><i>3. Biological membranes. Membrane proteins and processes taking place in membranes.</i></p> <p><i>4. Biocatalysis and enzymes. Fundamentals of the kinetics of enzymatic reactions.</i></p> <p><i>5. Basic metabolic pathways and dynamic regulation of substrate flow in metabolic pathways (glycolysis, gluconeogenesis, beta oxidation, glycogenolysis, tricarboxylic acid cycle)</i></p> <p><i>6. Energy processing in specialized biological membranes. The electron transport chain</i></p> <p><i>7. Lipid metabolism</i></p> <p><i>8. Biosynthesis of lipids. Biosynthesis of cholesterol and other steroids.</i></p> <p><i>9. Protein and amino acid metabolism. Urea cycle.</i></p> <p><i>10. Metabolism of nucleic acids and nucleotides.</i></p> <p><i>11. Genetic information. Types of RNA and their role in the cell. Transcription and post-transcriptional processing of RNA.</i></p> <p><i>12. Decoding genetic information. Translation and genetic code.</i></p> <p><i>13. Biosynthesis of proteins and their post-translational modifications. Protein targeting.</i></p> <p>Laboratory/Lab</p> <p><i>1. Basic biochemical calculations</i></p> <p><i>2. Podstawowe obliczenia biochemiczne.</i></p>

3. Spectrophotometric determination of one component on the basis of a standard curve
4. Protein denaturation
5. Acid-base properties and color reactions of amino acids and proteins
6. Quantitative protein determination by the biuret method
7. Carbohydrates - properties of simple and complex sugars
8. General characteristics of fats and steroids
9. Chemical characterization of nucleic acids
10. Enzymes - influence of pH value, temperature, activators and inhibitors on enzymatic activity (amylase)
11. Paper chromatography of amino acids

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Describes the structure and properties of the basic classes of chemical compounds and macro-molecules found in living organisms, as well as the basic metabolic intermediates.	BIO1A_W01 BIO1A_W02 BIO1A_W04
W02	Describes and explains the basic anabolic processes in the cell and the basics of metabolism regulation.	BIO1A_W01 BIO1A_W02 BIO1A_W04 BIO1A_W011
W03	Applies selected methods of identification, isolation and separation of basic classes of compounds that build living organisms.	BIO1A_W08
within the scope of ABILITIES:		
U01	Explains the basics of enzymatic catalysis and the processes of capturing and converting energy in metabolic changes.	BIO1A_U02
U02	Identifies the presence of sugars, proteins or nucleic acids in a test sample.	BIO1A_U01 BIO1A_U02 BIO1A_U06
U03	He/She plans a method of quantifying protein, DNA and RNA in biological material and performs appropriate analyzes	BIO1A_U01 BIO1A_U02 BIO1A_U06
within the scope of SOCIAL COMPETENCE:		
K01	He/She works both individually and in a team	BIO1A_K01 BIO1A_K02 BIO1A_K03
K02	He/She actively participates in all biochemistry classes included in the study plan	BIO1A_K01 BIO1A_K02 BIO1A_K03

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01	+	+		-	+					-	+					-	+				
W02	+	+		-	+					-	+					-	+				
W03	+	+		-	+					-	+					-	+				
U01	+	+		-	+					-	+					-	+				
U02	+	+		-	+					-	+					-	+				
U03	+	+		-	+					-	+					-	+				
K01	-	-		-	-					-	+					-	+				
K02	-	-		-	-					-	+					-	+				

*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	3	51-65 % of total points
	3,5	66-75 % of total points
	4	76-85 % of total points
	4,5	86-95 % of total points
	5	96-100 % of total points
classes (C)* (including e-learning)	3	52-58 % of total points
	3,5	59-68 % of total points
	4	69-77 % of total points
	4,5	78-87 % of total points
	5	88-100 % of total points
others (...)* (including e-learning)	3	
	3,5	
	4	
	4,5	
	5	

5. BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	82	
<i>Participation in lectures*</i>	30	
<i>Participation in classes, seminars, laboratories*</i>	45	
<i>Preparation in the exam/ final test*</i>	8	
<i>Others (please specify e.g. e-learning)*</i>		
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	67	
<i>Preparation for the lecture*</i>	17	
<i>Preparation for the classes, seminars, laboratories*</i>	25	
<i>Preparation for the exam/test*</i>	25	
<i>Gathering materials for the project/Internet query*</i>		
<i>Preparation of multimedia presentation</i>		
<i>Others *</i>		
TOTAL NUMBER OF HOURS	150	
ECTS credits for the course of study	6	

**delete as appropriate*

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)

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