

DESCRIPTION OF THE COURSE OF STUDY

Course code	0512.6.BIOT1.B/C.BF	
Name of the course in	Polish	<i>Biofizyka</i>
	English	<i>Biophysics</i>

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

1.1. Field of study	Biotechnology
1.2. Mode of study	Full-time
1.3. Level of study	Bachelor
1.4. Profile of study*	academic
1.5. Person/s preparing the course description	PhD, Karol Ciepluch
1.6. Contact	Karol.ciepluch@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	english
2.2. Prerequisites*	-

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lectures- 30 h, Laboratory-30 h	
3.2. Place of classes	Institute of Chemistry, Institute of Biology	
3.3. Form of assessment	Pass with grade	
3.4. Teaching methods	Lectures, Laboratory course	
3.5. Bibliography	Required reading	William C. Parke , Biophysics, A Student's Guide to the Physics of the Life Sciences and Medicine
	Further reading	-

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (including form of classes)

Lecture

- C1. Acquiring basic knowledge about the mechanism of transport of substances in living organisms.
- C2. Knowledge and understanding of the functions, structure and dynamics of biological membranes.
- C3. Acquiring information about the biophysical basis of organ functioning.
- C4. Acquiring information about the influence of physical and chemical factors on living organisms

Laboratory

- C5. Understanding the methods used in biophysics, their applications and the ability to analyze the results
- C6. Understanding how biological membranes work
- C7. Understanding the physical basis of spectroscopic and microscopic methods

4.2. Detailed syllabus (including form of classes)

Lecture

1. Basics of thermodynamics
2. Types of biomacromolecules
3. Spectroscopy and fluorescence
4. Structure and properties of biological membranes
5. Microscopy and its applications
6. The influence of physical and chemical factors on living organisms
7. Bioenergetics
8. Biophysical basis of the functioning of cells and sense organs
9. Free radicals
10. Selected research methods in biophysics

Laboratories

- Acquaintance with the basic physical phenomena used in biophysics methods and interpretation of their results
- Acquaintance with methods of research on the interactions of biomolecules in the environment water
- Acquaintance with spectroscopic methods, fluorescence and microscopy
- Familiarization with methods of testing the properties of biological membranes

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Understands the functioning of biomolecules in living organisms.	BIOT1A_W01 BIOT1A_W02 BIOT1A_W08
W02	Knows the basic research methods in biophysics, i.e. spectroscopy, fluorescence and microscopy	BIOT1A_W01 BIOT1A_W02 BIOT1A_W08
W03	Knows the structure and functions of biological membranes	BIOT1A_W01 BIOT1A_W02 BIOT1A_W08
W04	Knows the influence of chemical and physical factors on living organisms	BIOT1A_W01 BIOT1A_W02 BIOT1A_W08
within the scope of ABILITIES:		
U01	Is able to use an appropriate biophysical method to check the structure biomolecules, their properties and interactions with other molecules. Additionally is able to use an appropriate method to test the properties of biological membranes and research on the impact of external factors on living organisms	BIOT1A_U05 BIOT1A_U07
within the scope of SOCIAL COMPETENCE:		
K01	He/She works both individually and in a team	BIOT1A_K01 BIOT1A_K04

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)														
	Exam oral /written*			Test*			Project*			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		
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01	+	+		-	+		-	+		-	+		-	+	
W02	+	+		-	+		-	+		-	+		-	+	
W03	+	+		-	+		-	+		-	+		-	+	
W04	+	+		-	+		-	+		-	+		-	+	
U01	+	+		-	+		-	+		-	+		-	+	
K01	-	-		-	+		-	+		-	+		-	+	

*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

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

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>	65	
<i>Participation in lectures*</i>	30	
<i>Participation in classes, seminars, laboratories*</i>	30	
<i>Preparation in the exam/final test*</i>	-	
<i>Others*</i>	5	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	25	
<i>Preparation for the lecture*</i>		
<i>Preparation for the classes, seminars, laboratories*</i>	15	
<i>Preparation for the exam/test*</i>	5	
<i>Gathering materials for the project/Internet query*</i>		
<i>Preparation of multimedia presentation</i>	5	
<i>Others*</i>		
TOTAL NUMBER OF HOURS	90	
ECTS credits for the course of study	3	

**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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