



**MODULE / SYLLABUS**  
**EDUCATION CYCLE 2024-2027**

Module/subject name:		BIOCHEMISTRY AND BIOPHYSICS	
Direction:		NURSING	
Level of study*:		I degree (bachelor's degree) Second degree (master's)	
Education Profile:		practical	
Type of study*:		full-time / part-time	
Type of activities*:		compulsory X supplementary <input type="checkbox"/> elective <input type="checkbox"/> .	
Year and semester of study*:		Year of study*: I X II <input type="checkbox"/> III <input type="checkbox"/> .	Semester of study*: 1 X 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/>
Number of ECTS credits assigned		2	
Language of instruction:		Polish	
PSW Department Name:		Faculty of Health Sciences	
Contact (tel/email):		tel. 55 279 17 68 e-mail: dziekanat@psw.kwidzyn.edu.pl	
Type of module/course relating to professional preparation*:		<ul style="list-style-type: none"><li>• basic sciences X</li><li>• social sciences and humanities <input type="checkbox"/></li><li>• sciences in the fundamentals of nursing <input type="checkbox"/>.</li><li>• specialty care sciences <input type="checkbox"/></li></ul>	
Person responsible for the module/subject:			
Person(s) in charge:		According to the study plan	
Forms of student workload			Student workload (number of teaching hours)
Contact hours with an academic teacher (according to the study plan)			
Lectures (W)			30
Seminar (S)			
Conversations			
Exercise (C)			12
Practical classes (ZP)			
BUNA - independent work of the student (according to the study plan).			9
Student workload related to professional practice (according to the study plan)			
Total student workload - total number of			51
Number of ECTS credits for the subject/module			2, of which 0.5 BUNA
Didactic methods	<ul style="list-style-type: none"><li>• Traditional lecture supported by multimedia techniques, interactive lecture, administering methods,</li><li>• laboratory exercises,</li><li>• self-study.</li></ul>		
Assumptions and purpose of the subject	Familiarize students with the biochemical basis of the integrity of the human body, the structure and function of macromolecules found in the human body, and the biophysical basis of the functioning of the human body.		
Teaching tools	Multimedia presentations, molecular models and computer simulations to visualize biochemical and biophysical processes		
Prerequisites:	Basic knowledge of biology, chemistry and physics at the high school level.		
The matrix of learning outcomes for the module / subject in relation to methods of verification of achievement of the intended learning outcomes and the form of realization of learning activities			
Symbol learning outcome	Students who pass the module (subject) know/understand/are able to:	Methods of verifying the achievement of the intended learning outcomes	The form of implementation of teaching activities * enter symbol
A.W3.	Characterizes the participation of the body's systems and organs in maintaining its homeostasis.	Written and/or oral exam	W
A.W5.	Introduces the basics of control systems (homeostasis) and the role of positive and negative feedback.	Written and/or oral exam	W
A.W13.	Presents the physicochemical basis for the operation of the senses using physical information carriers (sound and electromagnetic waves).	Written and/or oral exam	W

A.W14.	Presents vitamins, amino acids, nucleosides, monosaccharides, carboxylic acids and their derivatives, included in the composition of macromolecules present in cells, extracellular matrix and body fluids.	<i>Written and/or oral exam</i>	W
A.W15.	Characterizes the regulatory mechanisms and biophysical basis of metabolism functioning in the body.	<i>Written and/or oral exam, project or oral response</i>	W/BUNA
A.W16.	It presents the effects of external factors such as temperature, gravity, pressure, electromagnetic field and ionizing radiation on the body.	<i>Written and/or oral exam, project or oral response</i>	W/BUNA
A.U5.	Participates in the selection of diagnostic methods for specific clinical conditions using knowledge of biochemistry and biophysics.	<i>Written colloquium</i>	Ć
O.K7.	Recognizes and recognizes his own limitations in knowledge, skills and social competence, and makes a self-assessment of deficits and educational needs.	<i>Observation, self-assessment</i>	W/Ć/BUNA

\*W-lecture; S-seminar; K-conversations; ZP-exercises; ZP-practical activities; PZ-internships; BUNA-student independent work.

#### SAMPLE METHODS FOR VERIFICATION OF LEARNING OUTCOMES

**In terms of knowledge (lectures/lectures):** oral examination (*non-standardized, standardized, traditional, problem-based*); written examination - the student generates / recognizes the answer (*essay, report; short structured questions /SSQ/; multiple choice test /MCQ/; multiple response test /MRQ/; matching test; T/N test; answer completion test*),

**In terms of skills (exercises/conversations):** Practical exam; Objective Structured Clinical Examination /OSCE/; Mini-CEX (mini - clinical examination); Completion of an assigned task; Project, presentation.

**In terms of social competence:** reflective essay; prolonged observation by supervisor/teacher-in-charge; 360° assessment (feedback from teachers, colleagues, patients, other colleagues); Self-assessment (including portfolio)

**BUNA** - the student's own work is verified through an assessment of the degree of realization of the established learning outcomes: a test verifying the student's knowledge of the topics specified in the syllabus, but also through credit work, projects, presentations and any other mid-semester work.

#### TABLE OF PROGRAM CONTENT

Program content	Number of hours	Relation of learning outcomes to ACTIVITIES
<b>LECTURES, semester I</b>		
1. Definition of biochemistry, molecular biology and biophysics and their importance in medicine. Biophysical and biochemical basis of the functioning of the human body.	1	A.W5. O.K7.
2. Biophysical basis of homeostasis.	1	A.W3. A.W5. O.K7.
3. Regulatory systems with feedback.	1	A.W3. A.W5. O.K7.
4. Transmission of information between cells and tissues.	1	A.W3. O.K7.
5. Linking disorders in molecules, reactions and biochemical processes to the occurrence of pathologies in humans.	2	A.W3. O.K7.
6. The main causes of diseases affecting various biochemical mechanisms in the cell and body.	2	A.W16. O.K7.
7. Macromolecules as structural components, catalysts, hormones, receptors or stores of genetic information.	2	A.W3. O.K7.
8. Properties of amino acids. Peptides - structure.	1	A.W14. O.K7.
9. The physicochemical basis of the operation of the senses.	1	A.W13. O.K7.
10. Three-dimensional structure, levels of order and biological properties of proteins.	2	A.W13. O.K7.
11. Classifications of proteins based on various criteria. Role and properties of enzymes; enzyme defects and their effects.	2	A.W14. O.K7.
12. Effects of physical factors on the body - temperature, pressure, ionizing radiation.	2	A.W16. O.K7.
13. Identifying basic processes in a living organism. Diagnostic value of enzyme tests.	2	A.W14. A.W16. O.K7.
14. Inborn defects of metabolism caused by genetically determined abnormalities in enzyme synthesis.	2	A.W15. O.K7.
15. Anabolic processes.	1	A.W16. O.K7.
16. Nucleoside triphosphates - a source of energy in anabolic processes.	2	A.W15. O.K7.
17. Gluconeogenesis.	2	A.W15. O.K7.

18. Glycogen synthesis.	1	A.W15. O.K7.
19. Synthesis of fatty acids and cholesterol.	1	A.W15. O.K7.
20. Phospholipid and urea synthesis.	1	A.W15. O.K7.
EXERCISES, semester I		
1. Exothermic reactions.	12	A.U5. O.K7.
2. Endothermic reactions.		
3. Biochemical processes versus mechanism of drug action.		
BUNA - independent student work, semester I		
1. Influence of environmental factors on the course of biochemical processes	9	A.W15-16., O.K7.
LITERATURE LIST		
<b>Primary Literature:</b> <ul style="list-style-type: none"><li>— Pasternak K., <i>Biochemistry. Textbook for undergraduate medical students</i>, PZWL, Warsaw 2019.</li><li>— Jaroszyk F. (ed.), <i>Biophysics - Handbook for students</i>, Wyd. Lekarskie PZWL, Warsaw 2014 (reprint 2018)</li></ul>		
<b>Supplementary literature:</b> <ul style="list-style-type: none"><li>— Bańkowski E., <i>Biochemistry</i>, Edra Urban &amp; Partner Publishers, Wroclaw 2020 (print 2022)</li></ul>		
Manner of passing and forms and basic evaluation criteria/examination requirements		
<b>Method of crediting</b> <ul style="list-style-type: none"><li>— Exam - lectures</li><li>— Passing grade - exercises</li><li>— Credit without a grade - BUNA</li></ul>		
<b>Forms and criteria for passing</b>		
CREDIT FOR THE SUBJECT - THE SUBJECT ENDS WITH AN EXAM		
<b>Lecture:</b> <p>The basis for obtaining a pass/fail is:</p> <ul style="list-style-type: none"><li>— Active participation in lectures (joining the discussion initiated by the lecturer, showing interest in the issues discussed during the lecture),</li><li>— BUNA credit</li><li>—</li></ul>		
<b>Exercises</b> <p>The basis for obtaining credit for a grade is:</p> <ul style="list-style-type: none"><li>— Attendance 100%; confirmed by an entry on the attendance list,</li><li>— Active participation in exercises (joining the discussion initiated by the lecturer, showing interest in the issues discussed during the exercises,)</li><li>— Positive evaluation of the colloquium - a test containing single-choice, multiple-choice and completion questions For a complete, correct answer, the student receives 1 point, incorrect or no answer 0 points, a minimum of 60% of correct answers qualifies for a passing grade.</li></ul>		
<b>BUNA - oral credit</b>		
<b>Grading criteria - oral answer</b>		
Evaluation	Criterion	
Very good	Correct, complete, independent response to 3 questions posed to the student by the instructor	
Good	Correct answer to 3 questions posed to the student, requiring little direction from the teacher	
Sufficient	Correct, incomplete, requiring significant direction from the teacher to answer 3 questions posed to the student	
Insufficient	No answer or incorrect answer to each of the 3 questions asked of the student	
<b>or project</b>		
<b>BUNA evaluation criteria - independent student work</b>		
Evaluation criteria	Evaluation: zal/nzal	
Compliance of the content of the work with the subject of education		
Substantive evaluation of the work		

Evaluation of the selection and use of sources	
Evaluation of the formal side of the work (footnotes, language)	
<i>*(recommendations for work).</i>	
	<i>(evaluation)</i>
	<i>(signature)</i>

\* if any of the criteria is not met, correct the work according to the lecturer's recommendations.

### FINAL EXAM IN THE SUBJECT

- In order to be admitted to the exam, it is necessary to obtain a pass in the lectures and to pass the exercises and BUNA.
- The exam is in the form of a written test, multiple-choice test /MCQ/ with one correct answer (each correct answer is 1 point, no answer or incorrect answer 0 points, a minimum of 60% correct answers qualifies for a passing grade.

### Grading criteria for the test

Evaluation	Very Good (5.0)	Good plus (4.5)	Good (4.0)	Sufficient plus (3.5)	Sufficient (3.0)	Unsatisfactory (2.0)
% of correct answers	93-100%	85-92%	77-84%	69-76%	60-68%	59% and below

FINAL COURSE GRADE:

Exam grade

### Conditions for making up classes missed for excused reasons:

Making up missed classes is possible only in the case of a student's illness documented by a medical exemption or other fortuitous reasons. Excuses for classes and credit for the material covered during the period of absence are made by the lecturer conducting the class.

Both a student returning from dean's leave and a student repeating a year are required to attend all classes and take the exam. Only in the case of obtaining a grade of at least satisfactory (3.0) on an exam in a given year, a student repeating a year due to another subject may be exempted from having to attend classes and pass and pass the subject.

**Acceptance:**  
**pro-rector for teaching affairs**