MODULE / SYLLABUS
EDUCATION CYCLE 2022-2025

Module/subject name:	**BIOCHEMISTRY AND BIOPHYSICS**	
Direction:	**NURSING**	
Level of study*:	**I degree (bachelor's)** II degree (master's degree)	
Profile of education:	**practical**	
Type of studies*:	**stationary**	
Type of classes*:	obligatory **X** supplementary □ to choose from □	
Year and semester of studies*:	Year of study*: I **X** II□ III □	Semester*: 1 **X** 2 □ 3□ 4□ 5 □ 6□
Number of ECTS credits assigned	**2**	
Language of instruction:	**English**	
Name of the PSW Department:	**Faculty of Health Sciences**	
Contact (tel./email):	**Tel.** 55 279 17 68 **e-mail:** dziekanat@psw.kwidzyn.edu.pl	
Type of module/subject relating to apprenticeships*:	• basic sciences **X** • social sciences and humanities □ • science in the basics of nursing care □ • specialist care □	
Presenter(s):	according to the studies plan	

Forms of student workload	**Student charge (number of teaching hours)**
Contact hours with an academic teacher (according to the study plan)	
Lectures (W)	**30**
Seminar (S)	
E-learning (e-L)	
Coversatories	
Exercises (C)	
Practical classes (ZP)	
BUNA - independent student work* (*according to the study plan)	**21**
Student's workload related to work placements (***according to the study plan)***	
Total student workload – total number	**51**
Number of ECTS credits per subject/module	**2, including 1 BUNA**

Didactic methods	• giving (lecture, talk), • programmatic (using audiovisual tools, boards), • activating (case method, situational method, • staging method, didactic discussion, project method), • analysis of clinical cases.
Assumptions and aim of the subject	Familiarizing students with the biochemical foundations of the integrity of the human body, the structure and function of macromolecules occurring in the human body and the biophysical foundations of the functioning of the human body.
Teaching tools	Board and multimedia projector, boards.
Prerequisites:	Basic knowledge of biology, chemistry and physics at the secondary school level.

Matrix of learning outcomes for the module / subject in relation to the methods of verifying the achievement of the intended learning outcomes and the form of implementation of didactic classes

Symbol learning outcome	The graduate: knows and understands / is able to / is ready to	Methods for verifying the achievement of the intended learning outcomes	Form of implementation of didactic classes * enter the symbol
A.W3.	Characterises the involvement of the body's systems and organs in maintaining its homeostasis.	*Written and/or oral examination*	W

A.W5.	Presents the fundamentals of the operation of regulatory systems (homeostasis) and the role of positive and negative feedback.	*Written and/or oral examination*	W
A.W13.	Presents the physicochemical basis of the operation of the senses using physical information carriers (sound and electromagnetic waves).	*Written and/or oral examination*	W
A.W14.	Presents vitamins, amino acids, nucleosides, monosaccharides, carboxylic acids and their derivatives, which are part of macromolecules present in cells, extracellular matrix and body fluids.	*Written and/or oral examination*	W
A.W15.	Characterises the regulatory mechanisms and biophysical basis of metabolic function in the body.	*Written and/or oral examination, draft or oral answer*	W/BUNA
A.W16.	Demonstrates the effects on the body of external factors such as temperature, gravity, pressure, electromagnetic fields and ionising radiation.	*Written and/or oral examination, draft or oral answer*	W/BUNA
A.U5.	Participates in the selection of diagnostic methods for specific clinical conditions using knowledge of biochemistry and biophysics.	*draft or oral reply*	BUNA
O.K7.	Recognises and acknowledges his/her own limitations in knowledge, skills and social competences and makes a self-assessment of deficits and learning needs.	*Observation, self-assessment*	W/BUNA

*****W-lecture; S-seminar; EL- e-learning; K -conversations; Ć-exercises; ZP-practical classes; PZ-professional internships; BUNA-independent student work

EXAMPLES OF METHODS FOR THE VERIFICATION OF LEARNING OUTCOMES

in the field of knowledge (lectures/seminars): spoken exam (*non-standardized, standardized, traditional, problem*); written exam – the student generates / recognizes the answer (*essay, report; short structured questions /SSQ/; multiple-choice test /MCQ/; multiple-answer test /MRQ/; match test; T/N test; answer completion test*),

in terms of skills (exercises/seminars): Practical examination; Objective Structured Clinical Examination (OSCE); Mini-CEX (mini – clinical examination); Implementation of the commissioned task; Design, presentation

in the field of social competences: reflective essay; prolonged observation by the tutor / teacher of the teacher; 360° assessment (opinions of teachers, colleagues, patients, other colleagues); Self-assessment (including portfolio)

BUNA – the student's own work is verified by assessing the degree of implementation of the assumed learning outcomes: a test checking the student's knowledge of the subject specified in the syllabus, but also through final papers, projects, presentations and any other mid-term work.

TABLE OF PROGRAMME CONTENTS

Program content	**Number of hours**	**Reference of learning** outcomes **to CLASSES**
LECTURES, semester I		
1. Definition of biochemistry, molecular biology and biophysics and their importance in medicine. Biophysical and biochemical basis of the human body.	1	A.W5. O.K7.
2. Biophysical basis of homeostasis.	1	A.W3. A.W5. O.K7.
3. Feedback regulatory systems.	1	A.W3. A.W5. O.K7.
4. Transmission of information between cells and tissues.	1	A.W3. O.K7.
5. Relation of disturbances in biochemical molecules, reactions and processes to the occurrence of pathology in humans.	2	A.W3. O.K7.
6. The main causes of diseases affecting a variety of 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. Physicochemical basis of sensory action.	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. The influence of physical factors on the body – temperature, pressure, ionizing radiation,	2	A.W16. O.K7.
13. Identification of basic processes occurring in a living organism. Diagnostic value of enzymatic studies.	2	A.W14. A.W16. O.K7.
14. Inborn defects of metabolism due to genetically determined abnormalities in enzyme synthesis.	2	A.W15. O.K7.
15. Anabolic processes.	1	A.W16. O.K7.
16. Nucleosidotriphosphates – 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. Synthesis of phospholipids and urea.	1	A.W15. O.K7.
BUNA – independent student work, semester I		
1. Exothermic reactions.	5	A.W15. A.U5. O.K7.
2. Endothermic reactions.	5	A.W15. A.U5. O.K7.
3. Biochemical processes and the mechanism of action of drugs.	5	A.W15. A.U5. O.K7.
4. The influence of environmental factors on the course of biochemical processes.	5	A.W16. A.U5. O.K7.

LIST OF LITERATURE

Basic literature:

1. Davidovits P., *Physics in Biology and Medicine*, Academic Press 2018.
2. Michael A., PhD LiebermanAlisa, MD Peet, *Marks' Basic Medical Biochemistry*, Wolters Kluwer Health, cop. 2022.

Suplementary literature:

1. Emine E., AbaliSusan D. Cline, David S. Franklin, Dr. Susan M., Ph.D. Viselli, *Lippincott Illustrated Reviews: Biochemistry*, Wolters Kluwer Health, cop. 2021.

Forms of assessment and basic assessment criteria/examination requirements

Form of assesment

- Exam – lectures
- Credit without evaluation BUNA

Forms and criteria of obtaining credit

- CREDIT OF THE COURSE - THE COURSE ENDS WITH AN EXAM

Lecture:

- The basis for obtaining a pass/fail is:
- active participation in lectures (joining the discussion initiated by the lecturer, showing interest in the issues discussed during the lecture),
- passing the BUNA

BUNA – spoken pass

Evaluation criteria — spoken answer

Assessment	Criterion
Very good	Correct, full, independent answer to 3 questions asked to the student by the lecturer
Endorsement	Correct, requiring little orientation by the teacher, answer to the 3 questions asked to the student

Sufficient	Correct, incomplete, requiring significant orientation by the teacher answer to the 3 questions asked to the student
Insufficient	No answer or incorrect answer to each of the 3 questions asked to the student

or project

BUNA evaluation criteria - independent student work

Evaluation criteria	**Assessment: zal/nzal**
Compliance of the content of the work with the subject of education	
Substantive assessment of work	
Evaluation of the selection and use of sources	
Assessment of the formal side of the work (footnotes, language)	
	**(recommendations for work)*
(rating)	*(signature)*

* if any of the criteria are not met, the work should be corrected according to the lecturer's recommendations

FINAL EXAM IN THE SUBJECT

- A prerequisite for admission to the examination is a pass in the lectures and a pass in the BUNA
- The exam is in the form of a written test, multiple choice /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 pass mark.

Test evaluation criteria

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

FINAL GRADE IN THE SUBJECT:
- exam grade

Conditions for making up classes missed for excused reasons:

Making up for abandoned classes is possible only in the case of a student's illness documented by sick leave or Making up missed classes is possible only in the case of a student's illness documented by a medical exemption or other fortuitous reasons. Excusing classes and passing the material covered during the period of absence is done by the lecturer conducting the classes. Both a student returning from dean's leave and a student repeating a year are obliged to attend all classes and to take examinations. Only if a grade of at least "pass" (3.0) is obtained in an examination in a given year may a student repeating a year because of another subject be exempted from the obligation to attend classes and to pass the subject.

Acceptance: Vice-Chancellor for Science and Educational Quality