UNIWERSYTET PRZYRODNICZY WE WROCŁAWIU

Biochemistry

Educational subject description sheet

Basic information

Field of study Human nutrition and dietetics **Speciality** - **Organizational unit** The Faculty of Biotechnology and Food Science **Study level** First-cycle programme **Study form** Full-time **Education profile** General academic	**Education cycle** 2022/23 **Subject code** ND000000NZDS.L2.3018.22 **Lecture languages** polish **Mandatory** optional **Block** major subjects (conducted) in foreign languages **Disciplines** **Subject related to scientific research** No **Subject shaping practical skills** Nie

Teacher responsible for the subject	Wojciech Łaba
Other teachers conducting classes	Wojciech Łaba

Period	**Examination**	**Number of ECTS points**
Semester 2	exam **Activities and hours** lecture: 20 e-learning lecture: 10 laboratory classes: 45	6.0

Goals

C1	The aim of the course is to get knowledge on the structure and function of organic compounds in living organisms, main pathways of cellular metabolism and ways of its regulation and integration. The program of lectures also includes issues concerning the kinetics of enzymatic reaction and mechanisms of energy transfer. The purpose of the laboratories for students is to learn basic methods of biochemical analysis.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	knows structure and function of biologically important molecules	NŻD6_ P6S_WG09, NŻD6_P6S_WG01	written exam, presentation
W2	knows principles of enzymes' action in metabolic processes, describes kinetics of enzymes' action	NŻD6_P6S_WG02, NŻD6_P6S_WG04	written exam, presentation
W3	explains the ways of regulation and integration of metabolism in a cell	NŻD6_ P6S_WG09, NŻD6_P6S_WG01	written exam, presentation
W4	has knowledge in the terms of basic biochemical concepts and terminology.	NŻD6_P6S_WG02	written exam, presentation
Skills – Student can:			
U1	understands biochemical processes in nature	NŻD_ P6S_UW07	observation of student's work, performing tasks, practical training report
U2	knows equipment in biochemical laboratory and specificity and rules of safe work with chemicals	NŻD_ P6S_UW01, NŻD_ P6S_UW02, NŻD_ P6S_UW03	observation of student's work, performing tasks, practical training report
U3	uses principal quantity and quality methods for determination of biological substances	NŻD_ P6S_UW01, NŻD_ P6S_UW02	observation of student's work, performing tasks, practical training report
U4	is able to use professional terminology in a foreign language	NŻD_ P6S_UK10	observation of student's work, performing tasks, practical training report
Social competences – Student is ready to:			
K1	is aware of responsibility for common accomplished research and for entrusted equipment	NŻD_ P6S_KR06	observation of student's work
K2	understands importance of keeping the rules of safety and health work,	NŻD_ P6S_KO03, NŻD_ P6S_KR06	observation of student's work
K3	understands need for learning throughout life and updating knowledge related to the practiced profession.	NŻD_ P6S_KK01	observation of student's work

Balance of ECTS points

Activity form	Activity hours*
lecture	20

e-learning lecture	10
laboratory classes	45
presentation/report preparation	18
exam / credit preparation	30
consultations	2
lesson preparation	40
report preparation	10
collecting and studying literature	5

Student workload	**Hours** 180	**ECTS** 6.0
Workload involving teacher	**Hours** 75	**ECTS** 3.0
Practical workload	**Hours** 55	**ECTS** 2.0

* hour means 45 minutes

Study content

No.	Course content	Activities
1.	1. Structure and function of cellular macromolecules. 2. Characteristics, mechanisms and kinetics of enzyme activity. 3. Digestive enzymes. 4. Coenzymes. Vitamins water-soluble, lipid-soluble vitamins. Role and function vitamins in metabolism. 5. Basic metabolic pathways. 6. Regulation of human metabolism and digestive processes. 7. Structure and functions of nucleic acids. 8. Integration of cellular processes.	lecture
2.	1. Presentation of a selected subject in the field biochemistry.	e-learning lecture
3.	1. Introduction, calculation exercises. 2. Properties of amino acids and proteins. 3. Quantitative determination of proteins. Lowry method. 4. Buffer solutions. 5. Determination of reducing sugars by DNS and Nelson's method. 6. Nucleic acids. 7. Properties of enzymes. Urease 8. Determination of α-amylase activity. 9. L (+) lactate dehydrogenase from yeast. 10. Glutamate oxaloacetic transaminase (GOT). 11. Evaluation	laboratory classes

Course advanced

Teaching methods:

presentation / demonstration, computer lab/laboratory, lecture

Activities	Examination methods	Percentage in subject assessment
lecture	written exam	50%
e-learning lecture	presentation	5%
laboratory classes	observation of student’s work, performing tasks, practical training report	45%

Literature

Obligatory

1. Biochemia, krótkie wykłady. Hames B.D., Hooper N.M., PWN, 2019
2. Biochemistry. Berg J.M., Tymoczko J.L., Stryer L,. New York : W. H. Freeman and Company, 2012.

Kierunkowe efekty uczenia się

Kod	Treść
NŻD6_P6S_WG01	The graduate knows and understands to an advanced degree the facts and concepts of chemistry, mathematics, biochemistry, and microbiology appropriate to the major in human nutrition and dietetics
NŻD6_P6S_WG02	The graduate knows and understands issues of human anatomy and physiology and the functioning of the human body in the natural environment
NŻD6_P6S_WG04	The graduate knows and understands research methodology and basic theories in human nutrition and dietetics
NŻD6_ P6S_WG09	The graduate knows and understands to an advanced degree selected concepts and mechanisms related to health and its protection in the field of human nutrition and dietetics
NŻD_ P6S_KK01	The graduate is ready to critically evaluate their knowledge and skills and to consult experts when they have difficulty solving a problem independently
NŻD_ P6S_KO03	The graduate is ready to take actions aimed at ensuring high quality of food and human nutrition
NŻD_ P6S_KR06	The graduate is ready to adhere to the principles of professional ethics, including responsibility for the effects of therapies, education, and other activities associated with the dietetics profession and to require this of others
NŻD_ P6S_UK10	he graduate is able to use a foreign language at B2 level of the Common European Framework of Reference for Languages
NŻD_ P6S_UW02	The graduate can use equipment and apparatus, plan and conduct simple experiments and measurements, including the selection of appropriate methods, dietary treatments and materials for research, interpret the obtained results and draw conclusions
NŻD_ P6S_UW03	The graduate can perform simple analyses using chemical, biological and physical methods and techniques in the field of food technology and human nutrition, using appropriate apparatus.
NŻD_ P6S_UW07	The graduate can make an initial organizational and economic assessment of proposed technical and technological applications and professional activities undertaken in the field of consumer services, basics of hotel management as well as human nutrition and dietetics, including marketing analysis
NŻD_ P6S_UW01	The graduate can use the equipment and apparatus used in human nutrition and dietetics