

Biochemistry - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Biochemistry
Kod przedmiotu	13.6-WB-OS2P-B-ch-S17
Wydział	Wydział Nauk Biologicznych
Kierunek	Environmental Protection
Profil	ogólnoakademicki
Rodzaj studiów	pierwszego stopnia z tyt. licencjata
Semestr rozpoczęcia	semestr zimowy 2022/2023

Informacje o przedmiocie	
Semestr	3
Liczba punktów ECTS do zdobycia	7
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	- prof. dr hab. Aleksander Sikorski - dr hab. inż. Dżamila Bogusławska, prof. UZ

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	35	2,33	-	-	Egzamin
Laboratorium	45	3	-	-	Zaliczenie na ocenę

Cel przedmiotu

Getting to know and understand the chemical basis of the structure and function of the body.

Wymagania wstępne

The basic knowledge of inorganic and organic chemistry and biophysics.

Zakres tematyczny

Lecture Biochemistry - clarifying concepts and content. Amino acids and proteins. Peptide bond. Proteins - structure, classification, and the complexity of the structural and functional diversity. The parameters characterizing the properties of the proteins. Enzymes - basic functions. Enzyme inhibitors. Nucleic acids - structure, diversity, function, biosynthesis. The genetic code. Biosynthesis of proteins. Sugars - structure and function in the body. Lipids - complexity and classification, biosynthesis and catabolism of certain lipids. Vitamins - the characteristics and distribution of vitamins. Metabolism of basic concepts. Anabolic and catabolic processes. Coupled reactions. Glycolysis. Krebs cycle. Photosynthesis. Oxidative phosphorylation. Inputs of nitrogen to the biosphere. Chromatographic techniques. Electrophoresis. Basics of spectrophotometry.

Laboratory To acquaint students with the research apparatus used in the biochemical laboratory. Service, maintenance. Discussion of principles regarding the preparation of biochemical reagents. Biochemical calculations. Qualitative and quantitative analysis of carbohydrates. Identification of unknown sugar. Qualitative and quantitative analysis of specific fats. The reaction of saponification of specific fats. Fat numbers. Preparation and analysis of lecithin from egg yolks. Qualitative and quantitative analysis of vitamins. Characteristic reactions of amino acids. Reactions characteristic for selected amino acids. Identification of an unknown amino acid. Quality analysis of proteins. Protein properties in solution. Sacking of egg protein (separation of albumin from globulins). Protein denaturation. Quantitative analysis of proteins. Spectrophotometric analysis. Enzymatic reaction. Inhibitors and activators. Determination of activity and detection of selected enzymes. Acid hydrolysis of nucleic acids. DNA and RNA isolation. Quality analysis of nucleic acids. Pentose detection. Detection of purine and pyrimidine bases. Detection of orthophosphoric acid (V). DNA electrophoresis in agarose gel. Quantitative analysis of nucleic acids. Determination of purity of nucleic acid preparations.

Metody kształcenia

Lecture: giving method - lecture in the form of a multimedia presentation in the classroom;

Laboratory: giving method: discussion on the application of analytical methods; Practical method: lab exercises with the use of selected: biochemical methods, methods for documenting the results and bioinformatics programs.

Efekty uczenia się i metody weryfikacji osiągania efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
student explains the basics of molecular variation and evolution of organisms and the global importance of certain metabolic processes, such as photosynthesis, the assimilation of molecular nitrogen to the biosphere.	K1A_W06	- egzamin - ustny, opisowy, testowy i inne - kolokwium	- Wykład - Laboratorium

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
student solves simple problems in the field of biochemistry and molecular biology, prepares reports from performed laboratory experiments, uses basic laboratory equipment (pipettes, electrophoresis equipment and chromatography, spectrophotometers, pH meters, etc.), conduct experiments according to the procedures.	• K1A_W04 • K1A_W05 • K1A_U03	• aktywność w trakcie zajęć	• Laboratorium
student working in a group and organize the work in a particular experiment, listens to comments of the teacher and apply its	• K1A_K01 • K1A_K30	• aktywność w trakcie zajęć	• Laboratorium
student applies the method of self-study and understand that they possess the knowledge and experience gained in this field is essential for the reliable implementation of the biological experiments	• K1A_K03	• wykonanie sprawozdań laboratoryjnych	• Laboratorium
student explains the molecular basis of the functioning of a living organism, especially functions of the cell	• K1A_K05	• egzamin - ustny, opisowy, testowy i inne	• Wykład • Laboratorium

Warunki zaliczenia

LECTURE: provided credit is to get positive results from written examination test. Least 50% of scored points are required to get the pass mark credit.

LABORATORY: provided credit is class attendance and getting positive results of the tests (a positive mark above 50% of scored points), and credit of all written reports from performed laboratory experiments. The final mark consists of the average sum of all of the passed partial marks.

Literatura podstawowa

1. Berg, J.M, Tymoczko, J.L. , Stryer, L., *Biochemia*, Wydawnictwo Naukowe PWN, Warszawa, 2005, wydanie IV zmienione.
2. Berg, J.M, Tymoczko, J.L. , Stryer, L., *Biochemia*, Wydawnictwo Naukowe PWN, Warszawa, 2009, wydanie VI zmienione.

Literatura uzupełniająca

1. P. Kafarski & B. Lejczak, *Chemia bioorganiczna*, PWN, Warszawa, 1994.
2. J. Staniec, A. Bojarska *Ćwiczenia z biochemii dla studentów biologii*, Wydaw. Naukowe AP, Kraków, 2001
3. L. Kłyszejko-Stefanowicz *Ćwiczenia z biochemii*, PWN, Warszawa, 2018.
4. A. Zgirski, R. Gondko *Obliczenia biochemiczne* , PWN, Warszawa, 2010

Uwagi

Zmodyfikowane przez dr Olaf Ciebiera (ostatnia modyfikacja: 20-04-2022 09:15)

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