



Sylabus przedmiotu - część A Biochemisty 1/2

**48SJ0-
BIOCHE12
ECTS: 5.00
CYKL: 2023**

TREŚCI MERYTORYCZNE

WYKŁAD

Amino acids, peptides and proteins structure, properties and functions. Enzymes - properties, kinetics of reaction and activity regulation. DNA structure, replication and repair. RNA structure, synthesis and processing. Protein synthesis. Regulation of gene expression.

SEMINARIUM

The major buffer systems in the body (metabolic acidosis and alkalosis). Oxygen toxicity and free-radical injury. Biochemistry of cell membranes. Blood plasma proteins. Hemostasis and thrombosis. Disorders of synthesis and/or structure of proteins. Processing of proteins in the cells.

ĆWICZENIA

Quantitative protein identification. Electrophoresis of serum proteins. Fibrinogen release and its quantitative identification. Isolation and identification of peroxidase activity. Determining the Michaelis constant and maximum velocity for peroxidase reaction. Identifying the activity of ALT, AST, and γ -GT in blood serum. Isolation of genomic DNA from blood cells and cheek epithelium cells. Quantitative and qualitative assessment of isolated DNA. Amplification of selected DNA fragment by PCR method.

CEL KSZTAŁCENIA

During the course, the students are familiarised with molecular basics of the human body functioning in physiological and pathological conditions. They master the main metabolic pathways and are familiarized with genetic and environmental factors disturbing their course. The students also learn basic laboratory methods and techniques as well as the equipment applied in laboratory diagnostics. As a result, they obtain the expertise and skills necessary to understand the subjects taught in their further education (i.e.: physiology, immunology, pathology, clinical subjects) and indispensable in their future professional practice.

OPIS EFEKTÓW UCZENIA SIĘ PRZEDMIOTU W ODNIESIENIU DO OPISU CHARAKTERYSTYK DRUGIEGO STOPNIA EFEKTÓW UCZENIA SIĘ DLA KWALIFIKACJI NA POZIOMACH 6-8 POLSKIEJ RAMY KWALIFIKACJI W ODNIESIENIU DO DYSCYPLIN NAUKOWYCH I EFEKTÓW KIERUNKOWYCH

**Symbole efektów
dyscyplinowych:**

M/NMA_P7S_KR++, M/NMA_P7S_WG+++

**Symbole efektów
kierunkowych:**

B.W10.+, B.U13.+, K.10.+, K.6.++, B.U12.+, C.W47.+, K.7.+, D.U12.++, B.U10.++, D.U16.+, B.W2.+, B.U8.+, B.U9.+, K.5.+, K.9.+, KA7_KR1+, KA7_KR2+, B.W17.+, B.W14.+++, B.U3.+, B.U6.+, B.W23.+, E.W40.+, C.W51.+, B.W13.+, B.W1.+, B.W12.++, D.U17.+,

Akty prawne określające efekty uczenia się:

3112022

Dyscypliny: nauki medyczne
Status przedmiotu:

Obligatoryjny

Grupa przedmiotów:A -

przedmioty podstawowe

Kod: ISCED 0912

Kierunek studiów: Kierunek lekarski

Zakres kształcenia:

Kierunek lekarski - studia bezpieczeństwa - oferta w jęz. angielskim dla obcokrajowców

Profil kształcenia:

Ogólnoakademicki

Forma studiów: Stacjonarne

Poziom studiów: Jednolite magisterskie

Rok/semestr: /1

Rodzaj zajęć: Wykład, Seminarium, Ćwiczenia

Liczba godzin w

semestrze: Wykład: 10.00,

Seminarium: 15.00,

Ćwiczenia: 40.00

Język wykładowy:angielski

Przedmioty

wprowadzające: Biophysics, Chemistry, Molecular Biology and Genetics

Wymagania wstępne:Level

4 of The European

Qualifications Framework

(EQF) at least, and the

satisfactory level of

knowledge and skills covered

by the introductory subjects.

Nazwa jednostki org.

realizującej przedmiot:

Katedra Biochemii

Osoba odpowiedzialna za

realizację

przedmiotu: dr Edyta

Sienkiewicz-Szłapka

e-mail:

edyta.sienkiewicz@uwm.edu.p

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Uwagi dodatkowe:

Protective clothing (lab coat) during the laboratory classes is required.

EFEKTY UCZENIA SIĘ:**Wiedza:**

W1 - structure, properties, types and functions of proteins and nucleic acids

W2 - the course and importance of the processes of synthesis, modification and degradation of proteins and nucleic acids, as well as the health implications of these processes perturbations

W3 - functions of the genome, transcriptome and proteome and methods used to study them or used in laboratory diagnostics

W4 - concepts of regulation of genetic information expression (from gene to protein)

W5 - cell catalytic strategies and mechanisms of action of individual enzymes and their cofactors, as well as their biomedical significance

W6 - biochemical aspects of the acid-base balance mechanisms in the body in physiological and pathological conditions

W7 - the major sources of reactive oxygen species, mechanisms of protection against free radicals, and the effects of their action in the cell and in the body

W8 - the structure and composition of the cell membrane, its transport functions and functions related to the transduction of the biological signals with examples of dysfunctions leading to the development of different diseases

W9 - principles of isolation methods and quantitative and qualitative determination of proteins, enzymes, and nucleic acids

Umiejętności:

U1 - perform isolation, identification and quantification of proteins and nucleic acids using basic laboratory and molecular techniques (e.g. spectrophotometry, electrophoresis, PCR)

U2 - operate measuring instruments and assess the accuracy of measurements

U3 - analyze the results obtained, perform calculations assessing the concentrations or activity of the determined compounds and draw conclusions based on them, prepare documentation of the performed experiments

U4 - predict the direction of biochemical processes based on knowledge of regulatory mechanisms

U5 - use medical databases and peer-reviewed information sources as well as critically analyze medical literature

U6 - prepare and present scientific information in a simple and understandable way (multimedia presentation)

U7 - cooperates and works in a group assuming various roles in it

Kompetencje społeczne:

K1 - notice one's own limitations and make a self-assessing of educational deficits and needs

K2 - express one's opinion sensibly, candidly, and with respectability to the distinct opinion of the interlocutor

K3 - cooperate in a multicultural and multinational environment and show an understanding of ideological and cultural differences

K4 - present a favorable attitude toward the promotion of a pro-healthy lifestyle

K5 - comply with occupational health and safety rules in the laboratory

FORMY I METODY DYDAKTYCZNE:

Wykład(W1;W2;W3;W4;W5;U4;K1;K3;K4;):Conversational lecture with the use of multimedia

Seminarium(W1;W2;W3;W4;W5;W6;W7;W8;U4;U5;U6;U7;K1;K2;K3;K4;): Presenting a speech on an assigned subject, multimedia presentation, discussion, case study, debate,

Ćwiczenia(W1;W2;W3;W5;W9;U1;U2;U3;U5;U7;K1;K2;K3;K4;K5;):laboratory experiments

FORMA I WARUNKI WERYFIKACJI EFEKTÓW UCZENIA SIĘ:

Wykład (Kolokwium pisemne) - Unit tests checking the knowledge of problems discussed on the lectures; each about 40 questions; questions: closed type with one or more correct answers (BOFs/MCQs), true-false, matching the right answer or open-question type with a short answer - W1, W2, W3, W4, W5, U4, K1

Seminarium (Prezentacja) - an oral presentation of the selected problem (with multimedia support) - W1, W2, W4, W5, W6, W7, W8, U4, U5, U6, U7, K2, K3, K4

Seminarium (Sprawdzian pisemny) - written checking of knowledge in the field of problems assigned to the lab classes (short test with 6 questions; questions: closed type with one or more correct answers (BOFs/MCQs), true-false, matching the right answer or open-question type with a short answer - W1, W2, W3, W4, W5, W6, W7, W8, U4, K1

Seminarium (Udział w dyskusji) - being active in discussions - W1, W2, W3, W4, W5, W6, W7, W8, U4, U5, U6, U7, K1, K2, K3, K4

Ćwiczenia (Sprawdzian pisemny) - written checking of knowledge in the field of problems assigned to the lab classes (short test with 5 questions; questions: closed type with one or more correct answers (BOFs/MCQs), true-false, matching the right answer or open-question type with a short answer - W1, W2, W3, W4, W5, W9, U1, U2, U4, K1, K5

Ćwiczenia (Raport) - performing analyses and preparing laboratory report - W9, U1, U2, U3, U7, K3, K4, K5

LITERATURA PODSTAWOWA:

1. Harvey Richard and Ferrier Denise, *Lippincott's Illustrated Reviews: Biochemistry*, Tom 1, Wyd. Wolters Kluwer | Lippincott Williams Wilkins, R. 2017, s. 551

2. Lieberman Michael, Marks Allan D., *Marks' Basic Medical Biochemistry: A Clinical Approach*, Tom 1, Wyd. Wolters Kluwer | Lippincott Williams Wilkins, R. 2018, s. 1000

LITERATURA UZUPEŁNIAJĄCA:

1. Murray Robert K., Bender David A., Botham Kathleen M., Kennelly Peter J., Rodwell Victor W., Weil P., *Harper's Illustrated Biochemistry*, Tom 1, Wyd. The McGraw-Hill Companies, R. 2018, s. 800

2. Salway J.G., *Medical Biochemistry at a glance*, Tom 1, Wyd. Wiley-Blackwell, R. 2012, s. 169

Szczegółowy opis przyznanej punktacji ECTS - część B

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Biochemistry 1/2

Na przyznaną liczbę punktów ECTS składają się:

1. Godziny kontaktowe z nauczycielem akademickim:

- udział w: Wykład	10.0 h
- udział w: Seminarium	15.0 h
- udział w: Ćwiczenia	40.0 h
- konsultacje	2.0 h
	OGÓŁEM: 67.0 h

2. Samodzielna praca studenta:

Preparation for colloquiums and written tests	35.00 h
preparation for practical classes (lab classes and seminars)	18.00 h
Preparation of reports	5.00 h

OGÓŁEM: 58.0 h

godziny kontaktowe + samodzielna praca studenta **OGÓŁEM: 125.0 h**

1 punkt ECTS = 25-30 h pracy przeciętnego studenta,
liczba punktów ECTS= 125.0 h : 25.0 h/ECTS = 5.00 ECTS

Średnio: **5.0 ECTS**

- w tym liczba punktów ECTS za godziny kontaktowe z bezpośrednim udziałem nauczyciela akademickiego	2.68 punktów ECTS
- w tym liczba punktów ECTS za godziny realizowane w formie samodzielnej pracy studenta	2.32 punktów ECTS