Karta przedmiotu / Course description

Informacje ogólne o przedmiocie / General information about the course	
1. Kierunek studiów / Major of study: Medical biotechnology	**2. Poziom kształcenia / Study level:** 1-st degree **3. Forma studiów / Form of study: full-time course**
4. Rok / Year: III	**5. Semestr / Semester: V**
6. Nazwa przedmiotu / Course name: Enzymology and protein chemistry	
7. Status przedmiotu / Course status: obligatory	
8. Jednostka realizująca przedmiot, adres, e-mail: **Name of Department, mailing address, e-mail:** Department of Biochemistry, Jedności 8, 41-200 Sosnowiec, Poland, Faculty of Pharmaceutical Sciences in Sosnowiec, Medical University of Silesia, Katowice, Poland e-mail: mkapral@sum.edu.pl	
9. Treści programowe przedmiotu Course contents: The objectives of this course are to introduce students to various theoretical and practical aspects of enzymology; and stimulates their interest in learning the structure, function and kinetics of enzyme and their role as catalyst and regulator of cell metabolism. The aim of teaching is to broaden the knowledge of the structure of enzymes, enzyme regulation mechanisms and the influence of their cofactors, activators and inhibitors on the course of enzymatic reactions. The scope of teaching includes techniques of isolation, separation and identification of enzymatic proteins as well as studies of their structure and activity. The objectives of this course is also to integrate the practical aspects of enzymology with the theory and to familiarize students with the practical use of enzymes in industry, medicine and pharmacology	
10. liczba godzin z przedmiotu / Number of hours for the course	**20**
11. liczba punktów ECTS dla przedmiotu / Number of ECTS points for the course	**2**
12. Formy i tematy zajęć / Forms and topics of classes **12.1. Lectures** **12.2. Seminars**	**Liczba godzin Number of hours**
S1 Introduction to enzymology, basic properties of enzymes. Nature of enzymes. Properties of enzymatic proteins. Chemistry and functions of enzymes in the cell.	**1**
S2 Classification and nomenclature of enzymes. Structure and function of coenzymes. Enzyme catalyzed reaction	**1**
S3 Basics of enzyme kinetics: Michaelis Menten equation and its transformation (Lineweaver–Burk plot). Influence of temperature and pH on enzymatic reactions. Inhibition of enzymes. Reversible and irreversible inhibitors.	**1**
S4 Mechanisms of enzyme-catalyzed reaction. Regulatory enzymes. Regulation of enzymatic action. Ribosomes and abzymes.	**1**
S5 Databases for enzymes. Identification of bioactive compounds with the use of computational methods	**1**
12.3 Laboratory classes	
C1 Methods of separation and quantitative determination of proteins.	**3**
C2 Determination of succinate dehydrogenase activity in liver homogenate using artificial electron acceptor. Determination of oxidoreductase activity of enzymes from potato extract.	**3**
C3 Practical use of the Warburg test to determine the activity of enzymes (alanine and aspartate aminotransferase, alcohol dehydrogenase) and determination of glucose concentration using the hexokinase method. Use of enzymes in clinical diagnostics, biotechnology, pharmaceutical and food industries.	**3**

C4 Kinetic properties of human invertase. C5 Target and ligand fishing web tools Automated docking tools LADME prediction	**3** **3**

13. Literatura / Readings

1. T Palmer, P L Bonner Enzymes. Biochemistry, Biotechnology, Clinical Chemistry. 2nd Edition, 2007.
2. D Nelson, M Cox Lehninger: Principles of Biochemistry, 6th edition, 2013.
3. Murray R.K., Granner D.K., Mayes P.A., Rodwell V.W. Harper's Illustrated Biochemistry 27th Edition, 2006

14. Kryteria oceny – szczegóły / Detail evaluation criteria

Zgodnie z zaleceniami organów kontrolujących / In accordance with the recommendations of the inspection bodies

Zaliczenie przedmiotu - student osiągnął zakładane efekty uczenia się / Completion of the course – student has achieved the assumed learning outcomes

Szczegółowe kryteria zaliczenia i oceny z przedmiotu są zamieszczone w regulaminie przedmiotu / Detail criteria for completion and evaluation of the course are specified in the course regulations