



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez
Unię Europejską w ramach
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Course title		ECTS code	
Fundamentals of enzymology		13.3.0472	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	pierwszego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia biomedyczna, chemia kosmetyków, chemia żywności
		specialization	wszystkie
Teaching staff			
prof. UG, dr hab. Dawid Dębowski; dr Agata Gitlin-Domagalska; dr Natalia Ptaszyńska			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		4	
Laboratory classes, Lecture		classes - 60 h	
The realization of activities		tutorial classes – 5 h	
classroom instruction		student's own work – 25 h	
Number of hours		Total: 100 h - 4 ECTS	
Lecture: 30 hours, Laboratory classes: 30 hours			
The academic cycle			
2024/2025 winter semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
<ul style="list-style-type: none"> - Laboratory experiments - Problem-solving tutorials - conducting experiments - multimedia-based lecture 		Final evaluation	
		Graded credit	
		Assessment methods	
		<ul style="list-style-type: none"> - written exam with open questions - graded course credit based on individual grades obtained during the semester - oral exam 	
		The basic criteria for evaluation	
		Lecture: positive grade received in written exam composed of 5-10 open questions covering issues listed in the course contents, answers to the questions will require solving tasks related to the learning outcomes; the scale of grades will be adjusted to the range of all rated exams	
		Term "0" - positive grade received in written exam composed of 5-10 open questions covering issues listed in the course contents (only for students who obtained grade 5 from laboratory course)	
		To take the exam the laboratory classes must be passed	
		Laboratory classes: • positive grade received in 4 preliminary testes (4 – 6 questions), that check knowledge required to perform experiments during the classes; accomplishment of all planned experimental work (quality of laboratory work, ability to team work and mode of work would be graded); analysis of obtained results performed as written report;	
		To complete the laboratory course each negative grade must be improved.	
Method of verifying required learning outcomes			
Required courses and introductory requirements			

<p>A. Formal requirements Organic chemistry, biochemistry</p> <p>B. Prerequisites Fundamentals of organic chemistry and biochemistry, skills to work in a chemical laboratory, knowledge of basic laboratory glassware, learning the principles of work in a biochemical laboratory</p>	
<p>Aims of education</p> <ul style="list-style-type: none"> • to acquaint students with all issues mentioned in the lecture contents; • to acquaint students with the basic enzymatic processes taking place in the body and their physiological significance and pathological states • to teach students how to perform experiments, using delivered instructions, aimed at testing enzymatic activity; • to develop the ability to critically assess and interpret obtained experimental results and analysis of scientific sources; 	
<p>Course contents</p> <p>A. Lecture: History of enzymology. Protein structures. Classification and division of enzymes. Enzymes in online databases (including BRENDA, MEROPS, EXPASY). Simple and complex enzymes. Substrate specificity of enzymes. Basics of enzymatic kinetics. Basic types of physiological regulation of enzymatic activity. Mechanisms of inhibition, classification of enzyme inhibitors. The concept and unit of enzymatic activity. Mechanisms of proteinase activity. Exemplary enzymes used in diagnostics and analysis. The use of enzymes in the food, pharmaceutical and cosmetics industries. Ribozymes.</p> <p>B. Laboratory classes : five exercises / experiments covering the following issues: determination of the enzymatic activity of the selected serine proteinase and pancreatic lipase. Determination of kinetic parameters (KM, kcat) for the selected chromogenic substrate of bovine β-trypsin. Determination of acid phosphatase content in potato homogenate. Study of starch digestion by amylase.</p>	
<p>Bibliography of literature</p> <p>Literature required to pass the course</p> <p>J. M. Berg, J. L. Tymoczko, L. Stryer, „Biochemia”, PWN, Warszawa 2009.</p> <p>E. Bańkowski „Biochemia”, Elsevier Urban & Partner Wrocław 2004.</p> <p>D.E. Metzler “Biochemistry: The chemical reactions of living cells” Second edition, Academic Press</p> <p>Monographic works provided by assistants leading classes,</p> <p>Extracurricular readings</p> <p>J.R. Whitaker, A.G.J Voragen, D.W.S. Wong “Handbook of food enzymology” CRC Press 2002</p> <p>Various academic handbooks concerning biochemistry</p>	
<p>The learning outcomes (for the field of study and specialization)</p>	<p>Knowledge</p> <ol style="list-style-type: none"> 1. defines and demonstrates type of enzymes 2. describes isolation and purification techniques of enzymes 3. has ability to utilize the online databases containing enzymes 4. distinguishes and characterizes basic types of physiological regulation of enzymatic activity 5. characterizes basic concepts describing the enzymatic kinetics 6. lists and characterizes exemplary enzymes used in diagnostics and analysis as well as enzymes that are markers of diseases.
	<p>Skills</p> <ol style="list-style-type: none"> 1. uses chemical terminology necessary to present (both in oral and written form) the content provided during the course; 2. has the ability to design and conduct basic experiments with enzymes, their inhibitors and substrates by choosing appropriate laboratory equipment, chemical reagents and applying appropriate techniques. 3. analyzes the results of performed experiments, draws conclusions about the correctness of their course; 4. is able to use the basic data bases and interprets the results found there
	<p>Social competence</p> <ol style="list-style-type: none"> 1. Understands the need of continuous education; 2. Takes care of laboratory equipment; 3. Carefully uses laboratory equipment and works cautiously with chemicals; 4. Appreciates the need of ability to team work according to assigned role (team leader/team member); 5. Is aware of the need of critical analysis of own work; 6. Shows cautious criticism when acquiring knowledge, especially these coming from mass media; 7. Is aware of the necessity of fair and reliable work;

Contact

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