


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
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 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Biochemistry of proteins - individual laboratory training (lab.)		13.6.0053	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	second tier studies (MA)
Intercollegiate Faculty of Biotechnology UG-MUG	Biotechnology	form	full-time
		specialty	all
		specialization	all
Teaching staff			
dr Andrea Lipińska; prof. UG, dr hab. Ewelina Król; dr Alicja Chmielewska; dr hab. Mariusz Grinholc, profesor uczelni; dr Łukasz Rąbalski			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		4	
Laboratory classes			
The realization of activities			
classroom instruction			
Number of hours			
Laboratory classes: 60 hours			
The academic cycle			
2021/2022 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	
- conducting experiments - consultations with course tutor; individual and team work of students is expected		Final evaluation	
		Graded credit	
		Assessment methods	
		- (mid-term / end-term) test - graded course credit based on individual grades obtained during the semester	
		The basic criteria for evaluation	
		- Final grade for laboratory classes is established on the basis of constituent grades in accordance with the following principles: 50% of the final grade is established on the basis of the grade obtained in the colloquium that checks knowledge acquired during the classes and individual work of the student on the basis of literature delivered by course tutor and chosen individually by the student; colloquium contains short open questions verifying the knowledge in the area of biochemistry of proteins; 25% of the final grade is calculated on the basis of the reports written on the basis of classes by the student with the use of informatics methods and statistical tools; the reports contain results, their interpretation and conclusions; 25% of the final grade is calculated on the basis of constituent grades assessing the ability to plan and conduct an experiment; the skills to use laboratory equipment, practical implementation of Health and Safety rules and evaluation of teamwork competence while performing experiments; this evaluation will be conducted by the course tutor for every student during one of the final classes (transcript of grades) - 100% presence is required during classes for course completion. In case of justified absence, there is a possibility to complete laboratory classes with a different group of students in accordance with its schedule.	

Method of verifying required learning outcomes	
Required courses and introductory requirements	
<p>A. Formal requirements Completion of Biochemistry course</p> <p>B. Prerequisites Knowledge of the methods of calculating concentrations of solutions is required, checked during the first laboratory class.</p>	
Aims of education	
<p>Students get acquainted with techniques, most frequently used in biotechnological laboratories, of working with proteins, their limitations and perspectives, created by modern biochemical techniques.</p> <p>Students will get to know protein biochemistry at the molecular level (properties of proteins and protein-protein interaction applied in chromatography methods of protein purification, electrophoretic analysis of proteins, quantitative analysis of proteins, protein immunodetection) (K_W01).</p> <p>Students will get to know the rules of health and safety in a biotechnological laboratory and will learn about hazards connected with performing laboratory work, including hazards of working with biological agents and GMO (K_W04).</p> <p>Students will acquire basic skills necessary in laboratory work and documentation of activities and results; in laboratory work they will learn to use, under supervision of the tutor, the basic techniques and research tools indispensable in biochemistry of proteins, particularly the methods of protein isolation, purification and detection; will acquire the ability to use basic laboratory equipment (analytical balance, automatic pipettes, electrophoresis equipment, chromatography columns, spectrophotometer) (K_U01).</p> <p>Students will gain the ability to collect and interpret empirical data and formulate conclusions on the basis of the collected data; in data analysis they will learn how to use statistical methods and informatics tools (K_U05)</p> <p>Students will learn teamwork during mutual realization of laboratory work in the field of biochemistry of proteins (K_K02)</p> <p>Students will acquire knowledge of the safety rules while working in a lab and responsibility for their own safety and the safety of others; they will learn to use the safety rules at work and proper conduct in hazardous situations (K_K05)</p>	
Course contents	
<p>The content of this laboratory course covers basic techniques used in the work with proteins. There will also be presented health and safety rules in a biotechnological laboratory, including hazards of working with pathogenic organisms and GMOs. Groups of 2-3 students will perform tasks by means of the following techniques: isolation of proteins coming from natural sources (e.g. egg protein) or recombinant (expression system of <i>E.coli</i>); protein purification by means of various chromatography methods and detection as well as analysis of proteins (SDS-PAGE, Western blotting, ELISA)</p>	
Bibliography of literature	
<p>- Chmielewska A, Krol E, Lipinska A, Rychlowska M: Protein biochemistry laboratory - Laboratory training materials (2017)</p> <p>- Bibliography required for the final completion of the course (colloquium)</p> <p>A. studied individually by students: materials delivered by course tutor in form of PDF files; Molecular cloning - A laboratory manual by Sambrook and Russel</p> <p>B. Supplementary bibliography: Students search for and select materials concerning classes on their own, making use of library resources and electronic sources of information.</p>	
The learning outcomes (for the field of study and specialization)	Knowledge
	Skills
	Social competence
K_W01 K_W04 K_U01 K_U05 K_K02 K_K05	K_W01 - Understands the basic biological phenomena on the molecular level, knows their significance for biotechnology and their relationships with other areas and disciplines of sciences K_W04 - Knows the basic rules of safety at work, understands the hazards of lab work, knows the hazards connected with conducting lab research, knows the hazards of working with pathogenic organisms and GMO K_U01 - Has the skills indispensable for lab work; is able to plan conducting an experiment and carry it out, is able to document on his own operations and results; in lab work, under the supervision of the tutor, uses complex techniques and research tools, is able to use lab equipment. K_U05 - Collects and interprets empirical data, in data analysis uses statistical methods and informatics tools, draws conclusions on the basis of empirical data K_K02 - Has an ability to work in a team, in particular, while performing laboratory work or preparing theoretical reviews within the field of biotechnology and related scientific areas and disciplines K_K05 - Is aware of the significance of rules of safety at work, particularly in a laboratory; applies the rules of safety at work; is responsible for his/her own safety and the safety of others; can react properly in hazardous situations

Contact

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