

COURSE DESCRIPTION (SYLLABUS)

1.	Course: Preparative Biochemistry
2.	Language of instruction: English
3.	Faculty Faculty of Biotechnology
4.	Course/module code: 29-BT-S1-E5-PBLeng
5.	Course/module type (<i>mandatory or elective</i>): mandatory
6.	Programme: Biotechnology
7.	Study cycle (<i>1st/2nd</i>): 1st cycle
8.	Year: 3rd
9.	Semester (<i>autumn or spring</i>): autumn
10.	Form of tuition and number of hours: Laboratory: 30 h
11.	Coordinator(s): Mateusz Krzyściak, MSc
12.	Initial requirements (<i>knowledge, skills, social competences</i>): Required basic knowledge of laboratory techniques i.e. pipetting, centrifugation, pH metering, spectroscopic techniques (UV-VIS). Basic chemical calculations.
13.	Objectives: Student will learn protein purification techniques and be able to plan protein purification strategy. The goal of the course is to purify basic pancreatic trypsin inhibitor from bovine lungs (BPTI) and finally asses quality of purified sample.
14.	Content: <ul style="list-style-type: none"> • Choice of tissue (plant/animal) material and setup of extraction conditions. • Clarification and condensation of extracted material. • Basic techniques applied during protein and peptides purification (precipitation,

	<p>fractionation, ion-exchange chromatography, hydrophobic chromatography, gel filtration, affinity chromatography, immuno-precipitation. HPLC and FPLC techniques; reverse phase chromatography (RP).</p> <ul style="list-style-type: none"> • Purification of recombinant proteins. • Scaling up of purification process. 	
15.	<p>Learning outcomes:</p> <p>Student:</p> <ul style="list-style-type: none"> • has knowledge of the basic techniques and research tools used in preparative biochemistry; • applies basic physical, chemical and biochemical techniques necessary for the study of biological processes; • carries out simple experiments or research expertise under the guidance of a tutor in the field of preparative biochemistry; can describe the results and present them in the form of a report • performs basic physical and chemical measurements; • knows how to work as a team, works together to solve problems and performing scientific experiments; • knows and follows the rules of safety and health at work. 	<p>Outcome symbols:</p> <p>K1_W06, K1_W08, K1_U01, K1_U05, K1_U07, K1_K02, K1_K05</p>
16.	<p>Recommended literature</p> <ul style="list-style-type: none"> • R. K. Scopes, 1987, <u>Protein Purification. Principles and Practice</u>. Springer-Verlag, New York; • R. Burgess, 1987, <u>Protein Purification. Micro to Macro</u>. Alan R. Liss. Inc. New York; • G. Piljac i V. Piljac, 1986, <u>Genetic Engineering. Liquid chromatography</u>. TIZ: Zrinski Calcovec. • J. Ch. Janson, 2011, <u>Protein Purification: Principles, High Resolution Methods, and Applications</u>, John Wiley & Sons, Inc. 	
17.	<p>Methods of verification of the assumed learning outcomes</p> <ul style="list-style-type: none"> • preparation of a written report specifically describing the performed experiments; • written test after the practice's completion. 	
18.	<p>Conditions of earning credits:</p> <p>Earning credits takes place on the basis of a written test (90% of the final grade) and written report on the experiments performed (10%).</p>	

19.	Student's workload:	
	Activity	Number of hours for the activity
	Hours of instruction (as stipulated in study programme): Laboratory classes: 30 h	30 h
	Student's own work: <ul style="list-style-type: none"> • study before classes; • preparation of the report; • preparation for the test. 	20 h
	Total number of hours:	50 h
	Number of ECTS:	2 ECTS