

SUBJECT/COURSE SYLLABUS

1.	Course name in Polish and English Preparative Biochemistry Preparatyka biochemiczna
2.	Scientific discipline Medical sciences Biotechnology
3.	Language of instruction English
4.	Unit conducting the course Faculty of Biotechnology
5.	Type of course compulsory
6.	Field of study Biotechnology
7.	Level of study first-cycle
8.	Year of study 3rd
9.	Semester winter
10.	Course form and number of hours Lecture, 15 h
11.	Prerequisites in terms of knowledge, skills and social competences for the course: <ul style="list-style-type: none"> • knowledge of structure and properties of biomacromolecules and biochemistry.
12.	Learning objectives for the course: Student will learn protein purification techniques and be able to design protein purification strategy .
13.	Curriculum content: <ul style="list-style-type: none"> • choice of tissue (plant/animal) material and setup of extraction conditions; • clarification and condensation of extracted material; • desalting of proteins; • methods of detection of purified proteins; • basic techniques applied during protein and peptides purification (precipitation, fractionation, ion-exchange chromatography, hydrophobic chromatography, gel filtration, affinity chromatography, immuno-precipitation. HPLC and FPLC techniques; reverse phase chromatography (RP); • purification of recombinant proteins; • scaling up of purification process.

14.	<p>Description of learning outcomes</p> <p>Student:</p> <ul style="list-style-type: none"> explains the basic biological phenomena and processes (e.g., protein structure and properties) that are necessary for protein purification.; applies appropriate mathematical and/or statistical methods to interpret experimental data from protein purification experiments; calculates protein yield, specific activity, and purification fold from experimental data; describes the principles and applications of basic techniques and research tools (e.g., precipitation, fractionation, chromatography) used in preparative biochemistry; designs a multi-step protein purification protocol for a specific protein, justifying the choice of each method based on protein properties; summarizes primary scientific literature in English related to protein purification methods and research, identifying key findings and methodologies; takes advantage of the online resources and literature to retrieve information on protein properties and relevant purification protocols. 	<p>Symbols for relevant directional learning outcomes:</p> <p>K1_W01</p> <p>K1_W02</p> <p>K1_W02</p> <p>K1_W06, K1_W08</p> <p>K1_W09, K1_K03</p> <p>K1_U03</p> <p>K1_U04</p>
15.	<p>Mandatory literature:</p> <ul style="list-style-type: none"> Materials and additional sources provided/indicated by the lecturer. Scopes RK., Protein Purification. Principles and Practice; Humana Press. <p>Recommended literature:</p> <ul style="list-style-type: none"> Franks F., Protein Biotechnology – Isolation, characterization and stabilization. Humana; Ableson JM., Simon MI., Deutscher MP. (red.) Methods in Enzymology V182. Guide to protein purification. Academic Press; Burgess R., AR. Liss; Protein Purification. Micro to Macro; Piljac G., Piljac V (ed.), TIZ Cakovec; Genetic Engineering. Liquid Chromatography. 	
16.	<p>Methods of verification of the assumed learning outcomes:</p> <ul style="list-style-type: none"> written exam 	
17.	<p>Conditions and form of credit for individual components of the course:</p> <ul style="list-style-type: none"> positive exam result. 	
18.	<p>Student workload expressed in teaching hours and ECTS credits</p>	<p>number of hours allocated for the course of a given type of classes</p>
	<p>classes (according to the study plan) with the instructor:</p> <ul style="list-style-type: none"> lecture 	<p>15 h</p>

	student's own work (including participation in group work) e.g.: <ul style="list-style-type: none"> • reading the literature indicated; • preparation for the final exam. 	25 h
	Total number of class hours:	35 h
	Number of ECTS credits:	2 ECTS