Course Syllabus

I. General Information

Course name in English	Techniques in protein biochemistry
Course name in Polish	Techniki w biochemii białek
Programme	Bioanalytical Technologies
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	MSc
Form of studies (full-time, part-time)	full-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	dr hab. inż. Andrea Baier/ dr Sebastian Pawlak

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	III	6
tutorial			
classes	30	III	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Knowledge in biochemistry, genetic engineering, molecular biology

II. Course Objectives

C1 – To acquaint students with the commercial production and isolation of specific proteins
C2 - To acquaint students with the subsequent utilization of proteins for applied purposes in industry and medicine
C3 - To acquaint students with advances in upstream processing and newer protein applications

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	Student has knowledge in the field of biochemistry and understands and is able to describe the principles of protein engineering	K_W01, K_W02
W_02	Has advanced knowledge in planning and conducting research experiments in protein analysis as well as knows the benefits and risks using GMO	K_W05, K_W06
W_03	Knows the fundamental principles of H&S in analytical laboratories	K_W07
SKILLS		
U_01	Applies advanced methods in protein isolation and characterization	K_U01
U_02	Writes scientific reports describing and interpreting own experiments and results	K_U06, K_U14
U_03	Complies safety rules in analytical laboratories and conducts evaluation of potential threats for the environment arising from laboratory work	K_U12, K_U15
SOCIAL COMPETENCES		
K_01	Understands the influence of biotechnological products, like proteins, on daily life, environment and health	K_K02
K_02	Takes care on laboratory equipment used to conduct analysis	K_K03
K_03	Complies principles of occupational health and safety in analytical laboratories	K_K05

IV. Course Content

Lecture:

1: Familiarizing students with the course syllabus and the content of course, Introduction into protein biochemistry and protein biotechnology
2: Large scale protein production
3: Protein sources
4: Protein purification and characterization
5: Immunochemical techniques applied in protein biochemistry
6: Therapeutic proteins
7: Proteins used for analytical purpose
8: Industrial proteins and enzymes

Classes:

Introduction, H&S rules
Chromatography techniques for protein purification
Immunochemical techniques for protein identification

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	conventional lecture	written test	evaluated written test/test
W_02	conventional lecture	written test	evaluated written test/test
W_03	Conventional lecture	Written test	Evaluated written test/test
SKILLS			
U_01	laboratory classes	Test of practical skills	Rating card
U_02	laboratory classes	report	Paper printout
U_03	laboratory classes	observation	Observation report
SOCIAL COMPETENCIES			
K_01	Laboratory classes	report	Paper printout
K_02	laboratory classes	Observation	Observation report
K_03	laboratory classes	Observation	Observation report

VI. Grading criteria, weighting factors.....Student workload

Lecture: Written exam - 90%, participation in lectures - 10%

Classes: written tests – 60 %, 20% reports, 20% work during classes

Mark	**Evaluation criteria**	
very good (5)	the student realizes the assumed learning outcomes at a very good level	the student demonstrates knowledge of the education content at the level of 95-100%
over good (4.5)	the student accomplishes the assumed learning outcomes an over good level	the student demonstrates knowledge of the education content at the level of 85-94 %
good (4)	the student accomplishes the assumed learning outcomes at a good level	the student demonstrates knowledge of the education content at the level of 75-84%
quite good (3.5)	the student accomplishes the assumed learning outcomes at a quite good level	the student demonstrates knowledge of the education content at the level of 65-74%
sufficient (3)	the student accomplishes the assumed learning outcomes at a sufficient	the student demonstrates knowledge of the education content at the level of 55-64%

	level	
insufficient (2)	the student accomplishes the assumed learning outcomes at an insufficient level	the student demonstrates knowledge of the education content below the level of 55%

VII. **Student workload**

Form of activity	Number of hours
Number of contact hours (with the teacher)	70 (60 + 10 individual consultation)
Number of hours of individual student work	80

VIII. **Literature**

Basic literature
G. Walsh: Proteins: Biochemistry and Biotechnology, Wiley-Blackwell N. Labrou: Protein Downstream Processing: Design, Development and Application of High and Low-Resolution Methods, Humana Press
Additional literature
R. J. Giannone, A.B. Dykstra: Protein Affinity Tags: Methods and Protocols, Humana Press