

COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) titl	Code						
Practicals in Biochemistry							
Lecturer(s)	se unit (module) is delivered						
Coordinator: lect. Zigmantas Žitkus	Institute of Biosciences, Life Science Center,						
Other(s):	Saulėtekio al. 7, LT-10223, Vilnius						

Study cycle	Type of the course unit (module)
Bachelor, Master	

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Face-to-face	Autumn	English

Requirements for students								
Prerequisites:	Biochemistry	or	General	biology	and	Additional requirements (if any): no		
General chemis	try, Organic che	mist	ry					

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours	
6	118	64	54	

Purpose of the course unit (module): programme competences to be developed

The course unit aims to develop:

Specific competences: knowledge of principal classic and modern biochemical methods, ability to perform many basic experimental techniques used routinely in laboratories of molecular sciences; practical skills of protein purification by chromatographic and other methods; enzyme research; and studies of metabolic reactions in microorganisms. Generic competences: scientific information gathering and use for setting up an experiment. Ability to organize tasks in laboratory for efficient work. Collecting and processing experimental data, critically interpreting ant presenting results, making appropriate conclusions.

Learning outcomes of the course unit (module)	Teaching and learning	Assessment methods
	methods	
Acquisition of practical skills to work in groups:	Exercises (performance of	A presentation (methods and
a) ability to design collectively an experiment,	experiment in a group, search	design of experiment, and
to coordinate the work in the groups, to organize	and analysis of information),	expected results and problems of
the discussion, to deal with emerging problems,	presentations (preparation and	experiment).
to present the collectively obtained results; b)	delivery of a presentation),	
ability to evaluate critically and adequately the	discussions.	
contribution of each member of the group		

	Contact hours							Se	Self-study work: time and assignments	
Content: breakdown of the topics	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	Contact hours	Self-study hours	Assignments	

1.	Introduction to internet resources in biochemical research.	4		4	6	Self-study of reference material.
2.	Classical experimental methods in biochemistry still widely used in laboratories today.	4		4	6	preparing for assessment.
3.	Modern biochemistry methods – from high throughput screening to single molecules approach.	4		4	6	
4.	Introduction to experimental work: gathering information and setting up an experiment.	4		4	6	
5.	Laboratory work. Enzyme purification by affinity column chromatography, characterization and analysis.	4	16	20	12	Searching and reading of experimental
6.	Laboratory work. Enzyme reaction kinetics and connections with mechanism.	4	12	16	10	problem relevant information, experimental data
7.	Lab work. Functionalization of pyridine derivatives with intact bacterial cells.	4	8	12	8	processing, lab reports preparation.
	Total	28	36	64	54	

Assessment strategy	Weight%	Deadline	Assessment criteria
Written test	25	During	Written test consists of 4 problems with simulated experimental data.
		the	Students have to explain experiment objectives, interpret results and
		autumn	draw appropriate conclusions. Each problem evaluated 2.5 points.
		semester	
Written reports of all	75	During	For each of three experimental works students prepare report with
experimental works		the	concise literature analysis, used methods, results analysis and
		autumn	conclusions.
		semester	

Author	Year of	Title	Issue of a periodical	Publishing place and house or web link
	public ation		or volume of a publication	
Compulsary reading				
D. L. Nelson, M. M. Cox	2017	Lehninger Principles of Biochemistry.	7-th ed.	H. Freeman and company
D. R. Appling, S. J. Anthony-Cahill, Ch. K. Mathews	2016	Biochemistry. Concepts and Connections	1-st ed.	Pearson Education, Inc.
R.F. Boyer	2012	Biochemistry laboratory : modern theory and techniques	2-nd ed.	Pearson Education, Inc.
Optional reading				
Jon Lorsch (Eds.)	2014	Laboratory Methods in Enzymology_ Protein Part C	1-st ed.	Elsevier Inc. Academic Press.
H. Bisswanger	2017	Enzyme Kinetics Principles and Methods	3-th ed.	Wiley-VCH Verlag GmbH & Co.