

PROGRAMOS DALYKŲ (MODULIŲ) APRAŠAI

Course unit (module) title			Code
Methods in Molecular Biology			
Lecturer(s)		Department(s) where the course unit (module) is delivered	
Coordinator: Giulio Preta Other(s):		Life Sciences Center Institute of Biochemistry, Saulėtekio al. 7, LT-10257, Vilnius	
Study cycle		Type of the course unit (module)	
Master		Elective	
Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction	
Seminars	1 th and 2 th semester, autumn/spring	English	
Requirements for students			
Prerequisites: Molecular Biology, Biochemistry, Cell Biology.		Additional requirements (if any):	
Course (module) volume in credits	Total student's workload	Contact hours	Self directed learning
5	120	56	64
Purpose of the course unit (module): programme competences to be developed			
<p><i>Main purpose is to obtain principal knowledge of main methodologies used in molecular biology with their strengths and weaknesses/limitations</i></p> <p><i>Development of subject competences: To obtain research-based knowledge about molecular biology techniques used in the development of different molecular diagnostic procedures and to be able to identify critical steps in the execution of the above mentioned techniques</i></p>			
Learning outcomes of the program	Learning outcomes of the course unit (module)	Teaching and learning methods	Assessment
Knowledge and its application	Different aspects of genetic engineering (cloning and creating mutations in DNA) in bacteria, yeast, plants and mammalian cells are acquired. Obtain knowledge in routinely used molecular biology techniques as PCR, Western Blotting, Immunoprecipitation and Chromatography. Basics knowledge of modern techniques such as bioinformatics, DNA microarrays and proteomics are also acquired. .	Lectures, interactive leaning methods, exercises, self-analysis of the literature.	Written exams
Ability to	To be able to troubleshooting		

conduct research	possible issues raising during execution of different molecular biology techniques.								
Personal skills	To be able to improve and update the acquired knowledge and practical skills continuously, by discussing and sharing opinions with other students.								
Special skills and Social skills	To be able to develop new and original ideas, adopt innovative solutions and application of methods, thinking strategically and presenting own ideas to others in an appropriate way.								
Content: breakdown of the topics	Contact hours							Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	Contact hours	Self-study hours	Assignments
1. Cell culture basics	4		4	2	2		12	20	Self-directed learning; learning of topic-related material by analysis of the literature
2. Recombinant DNA technology	4		4				8	10	Self-directed learning; learning of topic-related material by analysis of the literature
3. Different types of PCR and their application	4		4				8	10	Self-directed learning; learning of topic-related material by analysis of

									the online literature
4. Techniques in proteomics	4		4	2	2		12	10	Self-directed learning; learning of topic-related material by analysis of the online literature
5. Techniques in lipidomics	4		4	2	2		12	10	Self-directed learning; learning of topic-related material by analysis of the online literature
6. The role of bioinformatics in modern scientific research	4						4	4	Self-directed learning; learning of topic-related material by analysis of the online literature
Total	24		20	6	6		56	64	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Written exam	70	End of course	Written exam containing questions with open answer and multiple choice
Oral presentation	30	Individually set date	Oral presentation (a topic will be decided individually with a student).
Total	100		Mean of the scores of each assessment.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
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Compulsary reading				
Khalid Z. Masoodi, Sameena Maqbool Lone and Rovidha Saba Rasool	2021	Advanced Methods in Molecular Biology and Biotechnology: A Practical Lab Manual		

HEADLINES OF THE COURSE

- Lab hours will give students a first-hand experience with course concepts and the opportunity to explore methods used by scientists in biology.
- For lab hours I can provide the space for adequate experimental work, ensuring that safety standards are also followed. Depending on the number of students, there is also the possibility to divide, during experimental work, the class into small groups to provide a better learning experience.
- The tasks that the students will learn (i.e. splitting the cells) do not require extra or special reagents and materials and can be executed with the regular consumables already available and used in my group.