



MODULE DESCRIPTION

Module title	Module code
Bioinformatics	

Lecturer(s)	Department where the module is delivered
Coordinator: dr. Laurynas Riauba Other lecturers:	Department of Software Engineering Faculty of Mathematics and Informatics Vilnius University

Cycle	Type of the module
First	Optional

Mode of delivery	Semester or period when the module is delivered	Language of instruction
Face-to-face	5 th and 7 th semester	Lithuanian

Prerequisites
Prerequisites: Algorithm theory, Algorithms and data structures, Procedural programming, Object oriented programming.

Number of credits allocated	Student's workload	Contact hours	Self-study hours
5	130	66	64

Purpose of the module: programme competences to be developed		
Purpose of the module – knowledge transfer and achievement of capabilities in the fields of bioinformatics and biological data analysis		
<p>Generic competences:</p> <ul style="list-style-type: none"> • Communication and collaboration (<i>GK1</i>). • Life-long learning (<i>GK2</i>). <p>Specific competences:</p> <ul style="list-style-type: none"> • Knowledge and skills of underlying conceptual basis (<i>SK4</i>). • Software development knowledge and skills (<i>SK5</i>). • Technological and methodological knowledge and skills, professional competence (<i>SK6</i>). 		
Learning outcomes of the module: students will be able to	Teaching and learning methods	Assessment methods
Have deeper knowledge about living nature, structure and processes of living organisms Use main biological databases and tools Understand the principles behind biological data search and analysis algorithms Choose tools and methods to solve regular bioinformatical problems.	Lectures with discussions, case analysis, individual reading, laboratory works, and project assignment.	Laboratory works fulfillment, project assignment fulfilment and presentation, examination (in written form).

Content: breakdown of the topics	Contact hours						Self-study work: time and assignments		
	Lectures	Tutorials	Seminars	Practice	Laboratory work (LW)	Tutorial during LW	Contact hours	Self-study hours	Assignments
Introduction, basic knowledge about biological systems and processes.	6				2	8	8	8	
Biological data, databases, search algorithms	8				3		11	11	
Sequence analysis methods	10				3		13	13	
Origin of living organisms. Methods to investigate ancestry relationships between organisms	4				2		6	6	
Protein structures and methods of structure prediction	2				4		6	6	
Applications of bioinformatics	2				2		4	4	
Project assignments and presentations.					16		16	16	
Exam (in written form)							2		
Total	32				32	8	66	64	

Assessment strategy	Weight %	Deadline	Assessment criteria
2 laboratory works	20	During semester	Each tutorial assessed with max 10 points. Results of both tutorials are summed and divided by 10.
Project assignment	30	During semester	Project assignment is assessed according quality of project 2.4 points and presenting 0.6 points
Exam (in written form)	50	During exam session	Exam contains questions and tasks. Exam is assessed with max 10 points and multiplied by 0.5.

Author	Publishing year	Title	Number or volume	Publisher or URL
Required reading				
Marketa Zvelebil & Jeremy O. Baum	2008	Understanding bioinformatics		Garland Science
Recommended reading				
Neil C. Jones, Pavel A. Pevzner	2004	An introduction to bioinformatics algorithms		The MIT Press
David W. Mount	2004	Bioinformatics		Cold Spring Harbor Laboratory Press