



SYSTEMS BIOLOGY

Programme type	Master's studies (university)
Field of study	Medicine Technologies
Study area	Health Sciences
Qualification awarded	Master in Health Sciences
Length of programme	2 years (4 semesters)
Scope of programme (ECTS)	120
Language of instruction	English
Location	Vilnius, Lithuania
Starting date	1 st of September, 2017
Tuition fee EU students	3236 EUR/per year
Tuition fee Non-EU students	7500 EUR/per year

PROGRAMME DESCRIPTION

- *The objective*

The Systems Biology master's degree programme aims to prepare highly qualified biological systems analysts, laboratory specialists, and specialists who are able to organise and lead research projects, understand the processes of fundamental biological systems, describe the processes of evolutionary biological systems mathematically, and improve technological solutions and develop new ones to solve systems biology problems.

- *Career opportunities*

Systems Biology programme's graduates can find a job position in both public (universities, health care institutions, research institutes) and private (biotechnology and pharmaceutical companies) sectors. The specialists can also be attractive in valleys where science, studies and business are integrated. Students also can continue their career in PhD studies.

- *Access to further studies*

Graduates can continue their career in PhD studies (physical or biomedicine sciences).

KEY LEARNING OUTCOMES

After completing systems biology studies and acquiring a master's degree, a person will know the fundamental principles of biological systems and the development of organisms, will understand applied bioengineering laboratory equipment, and will have acquired an entirely new, holistic approach and knowledge of biological systems and the development of relationships between the parts and components as a functioning whole. A graduate will have mastered basic bioengineering (genetic and biological engineering) principles, mathematical modelling, computational principles of large systems and will be able to competently use multiprocessor computing environments to program biological (and other types of) tasks. Students will have the necessary knowledge and understanding of current methods of diagnosis and the ability to develop and apply new methods in the fields of medicine and biotechnology.

COURSE INFORMATION

The programme has the following structure

Course Type	1st Semester	2nd Semester	3rd Semester	4th Semester
Compulsory Courses	Genomics (10 ECTS)	Mathematical (10 ECTS)modelling	Proteomics (10 ECTS)	Preparation and defence of a master thesis (30 ECTS)
	Data mining (5 ECTS)	Epigenomics (5 ECTS)	Neurobiology (10 ECTS)	
		Transcriptomics (10 ECTS)	Mathematical physiology (5 ECTS)	
		Science forum (5 ECTS)**	Science forum (5 ECTS)**	
Elective Courses (Life and Health sciences bachelor)*	GNU / Linux type operating systems (5 ECTS)			
	Programming for biological data analysis (5 ECTS)			
	Multivariate statistics with R (5 ECTS)			
Elective Courses (Informatics and Physical bachelor)*	Human physiology (5 ECTS)			
	Genome structure (5 ECTS)			
	Cell biology (5 ECTS)			

* If a student has excellent knowledge from offered elective courses, in line with the Study program committee, the student can choose other course from MSc programs listed below:

"Biochemistry" (621C73001), "Genetics" (621C40001), "Computer modelling" (621I10002), "Software Engineering" (621I30001).

Restrictions for the selection: a course should have 5 ECTS; a course should not be taught later in the program.

** Seminars with a critical assessment of the latest and most advanced research articles in certain areas. Recent science news, issues, approaches are addressed. The seminars will be given by invited lecturers, potential employers

GRADUATION REQUIREMENTS

Public defence of the Master's Thesis.

ADMISSION REQUIREMENTS AND SELECTION CRITERIA

Requirements

- Bachelor's degree or its equivalent in study areas such as Informatics, Physical, Life or Health sciences;
- English language proficiency – the level not lower than B2 (following the Common European Framework of Reference for Languages (CEFR), or TOEFL score 75/IELTS score 6.

Selection Criteria

- CV, prepared according to [Europass](#)
- Scientific essay

Scientific essay topics for 2017 admission:

1. Reproducible research & reproducible computations — how to achieve it?
2. What could I do with synthetic yeast if Sc2.0 project was already completed?
3. Why do we age? What can be done to slow aging and increase healthy life-span?
4. Informatics and neurobiology
5. Informatics in life sciences

[More information for essay here.](#)

Admission contact

Please apply for more information at Admission Office by e-mail admissions@cr.vu.it