

MASTER'S RESEARCH PROJECT

Basic Information

This is a course, which contributes to MSc award in Biology

Course period	1 - 4 semester (throughout the study period)
Study credits	32 ECTS credits
Duration	1152 hours
Type of the course	Core course
Language of instruction	English
Academic requirements	<ul style="list-style-type: none">- BSc degree in Biology, Physics, Biophysics, Chemistry, Biochemistry, Environmental Sciences or equivalent (transcript of records),- Good command of English (certificate or other official document)

Research Project Description

The Research Project involves carrying out a substantial scientific research in the field of Biomedical Data Science.

Students are expected to choose a project from a list offered by potential supervisors, or to propose their own project and find a suitable supervisor.

Following on from the production of a research proposal, during the 1st semester, students undertake the main development work for their project and produce their final dissertation. They are also required to demonstrate what they have achieved in the dissertation defence.

Research Project Aims

- to provide an opportunity to pursue original research;
- to facilitate independent work;
- to embed knowledge and skills gained from the other modules and programs into scientific research.

Research Project Objectives

The course has been designed to:

- enable students to search the literature and gather background information on the problems and fields that the research project involves;
- develop students' written and oral presentation skill that will allow them to discuss existing results and present new findings;
- provide the participants with practical experience in designing and executing experiments in order to solve a particular biological problem using sound scientific principals;
- give students an understanding of how to organize and plan their time in order to carry out an agreed program of work in a constrained time frame;
- provide students with an opportunity to practice a range of bioinformatics skills, including those taught as part of the Research Project Process along with project-specific skills.

Learning Outcomes of the Research Project

After successful completion of a research project, students should be able to:

- Demonstrate an understanding of the foundations and applications of laboratory methods and techniques in the biological and biophysical sciences and competence in performing them.
- Design, plan, and execute an experiment, interpret the obtained experimental data and make a report.
- Perform a review and critical appraisal of the scientific literature relevant to the research project.
- Demonstrate appropriate written and oral communication skills for the presentation of the research project.

Teaching and learning Methods

Laboratory work and independent library research.

Course (module) Structure

Learning Activities	Hours
Practice sessions / Seminars,	56
Self-study Assignments	1096
Total study hours	1152

Research Project Schedule and Outline

Week	Topic	Learning Activities	Class-room hours	Self-study hours
Semester 1				
1	Choosing a research topic and justifying its relevance. Setting goals, research objectives	Meeting with scientific advisor (project supervision meetings)	4	-
2	Research planning. Choice of research methods and mathematical and e-tools for solving the assigned Research Project tasks	Meeting with scientific advisor (project supervision meetings)	4	10
3-6	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	64
7	Discussion of intermediate results of the Research Project	Meeting with scientific advisor (project supervision meetings)	2	10
8-10	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	64
11-12	Data processing, analysis of results	Self-Research Project work	-	32
13	Discussion of the results for the Research Project obtained in the current semester	Meeting with scientific advisor (project supervision meetings)	2	10
14	Report on the results of the Research Project obtained in the current semester	Science seminar	4	10
Semester 2				
1	Clarification of research	Meeting with	2	

Week	Topic	Learning Activities	Class-room hours	Self-study hours
	methods and mathematical and e-tools for solving the assigned Research Project tasks	scientific advisor (project supervision meetings)		
2-7	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	8
8	Discussion of intermediate results of the Research Project	Meeting with scientific advisor (project supervision meetings)	2	
9-14	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	6
15-16	Data processing, analysis of results	Self-Research Project work	-	6
17	Discussion of the results for the Research Project obtained in the current semester	Meeting with scientific advisor (project supervision meetings)	2	4
18	Report on the results of the Research Project obtained in the current semester	Science seminar	2	4
Semester 3				
1	Clarification of research methods and mathematical and e-tools for solving the assigned Research Project tasks	Meeting with scientific advisor (project supervision meetings)	4	10
2-6	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	136
7	Discussion of intermediate results of the Research Project	Meeting with scientific advisor	4	10

Week	Topic	Learning Activities	Class-room hours	Self-study hours
		(project supervision meetings)		
8-9	Data processing, analysis of results	Self-Research Project work	-	60
10	Discussion of the results for the Research Project obtained in the current semester	Self-Research Project work	4	10
11	Report on the results of the Research Project obtained in the current semester	Science seminar	4	10
Semester 4				
1	Clarification of research methods and mathematical and e-tools for solving the assigned Research Project tasks	Meeting with scientific advisor (project supervision meetings)	4	30
2-8	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	220
9-10	Data processing, analysis of results	Self-Research Project work	-	82
11	Discussion of intermediate results of the Research Project	Meeting with scientific advisor (project supervision meetings)	4	30
9-12	Experimental/theoretical research within the scope of the Research Project	Self-Research Project work	-	120
13-14	Data processing, analysis of results	Self-Research Project work	-	80
15	Discussion of the final results of the Research Project	Meeting with scientific advisor (project supervision	4	40

Week	Topic	Learning Activities	Class-room hours	Self-study hours
		meetings)		
16	Report on the final results of the Research Project	Science seminar	4	30

Research Project Scientific supervisor, Contact Information

Research Project scientific supervisors are employees of the Biophysics Department, Siberian Federal University and the Institute of Biophysics SB RAS; staff of the Laboratory of Bioluminescent Technologies of Siberian Federal University.

Contact information of a scientific supervisor of the Research Project will be provided to you at the first meeting with him/her.

Assessment

Form of assessment

Oral presentation of research results at a scientific seminar.

Grading scale

Experimental Work 40%; Report 50% and Oral Presentation 10%.

Attendance Policy

Attendance is not a major component in the Research Project.

The Research Project Process assesses the student's ability to plan and carry out a research project. Students are expected to do much of the work independently under the guidance of a supervisor.

Project oversight meetings with supervisor will offer advice on approaches and review research progress.

Web page of the course

The webpage of the course:

<https://e.sfu-kras.ru/course/view.php?id=12054>

is available through E-learning SibFU web site: www.e.sfu-kras.ru. You must be logged in to access this course. Course Guide and all accompanying materials are also available at the course web-page.

Facilities, Equipment and Software

The topic of Research Project determines the premises and the list of necessary scientific equipment and software.