

Ph.D. in Life Sciences

- The main objective of the **Ph.D. in Life Sciences** program is to **nurture knowledgeable internationally competitive scientists with interdisciplinary skills and expertise in life sciences technologies able to solve critical societal issues ranging from the molecular basis of human diseases to the development of environmental conservation and observation strategies.**
- The **aims** of the program **align with the Modernization 3.0 strategy** to succeed nationally and internationally and to **promote research and development in Kazakhstan.**



Program Structure and Academic Content (1)

The four-year 240 ECTS credit Ph.D. in Life Sciences is a research-intensive third cycle program designed according to the Bologna requirements. The curriculum of the program consists of three different types of courses:

- core pillar courses (36 ECTS),
- elective pillar courses (24 ECTS), and
- research pillar courses (Thesis Research and Thesis Dissertation; 180 ECTS).



Program Structure and Academic Content (2)

Discipline Core Courses (2)

DENG 782 Research Methods & Ethics (6 ECTS)

BIOL 720 Statistical Methods in Life Sciences (6 ECTS)

Department Core Courses (3)

BIOL 750 Structural and Molecular Biology in Health and Disease (8 ECTS)

BIOL 791 Cellular Biophysics (8 ECTS)

BIOL 780 Applied Bioinformatics (8 ECTS)



Department Electives (9)

BIOL 730 Advanced Neuroscience (8 ECTS)

BIOL 731 Synthetic Biology (8 ECTS)

BIOL 732 Drug Discovery and Design (8 ECTS)

BIOL 735 Hot Topics in Life Sciences (6 ECTS)

BIOL 734 Advanced Cancer Biology (8 ECTS)

BIOL 737 Advanced Optical & Electron Microscopy (8 ECTS)

BIOL 751 Advanced Topics in Cell Structure/Function (8 ECTS)

BIOL 760 Molecular Biology of Prokaryotic Cells (8 ECTS)

BIOL 770 Advanced Biotechnology (8 ECTS)

BIOL 775 Gene Therapy (8 ECTS)

Research Courses (2)

BIOL 799 Thesis Research (0 ECTS)

BIOL 800 Doctoral Thesis (180 ECTS)

Sample Schedule (1)

Year 1: Fall Semester (1 st Semester)					
Course		Academic Unit	ECTS Credits	Workload	
				Class Hours	Self-study Hours
Discipline Core	Research Methods & Ethics* (DENG 782)	SEDS	6	45	105
	Statistical Methods in Life Sciences* (BIOL 720)	SEDS	6	45	105
Dept. Core	Structural and Molecular Biology in Health and Disease * (BIOL 750)	BIOL	8	45	155
	Thesis Research (BIOL 799)	BIOL	0	0	30
Dept. Elective	Graduate Elective Course 1	All**	8	45	155
SEMESTER SUBTOTAL:			28	180	550

(*) Course may be waived for NU graduates and replaced by a Level-8 (Bologna process) course (core or elective) selected by the student's supervisory committee and approved by the corresponding departmental committee.

(**) All participating schools and departments with Level-8 courses

Sample Schedule (2)

Year 1: Spring Semester (2 nd Semester)					
Course		Academic Unit	ECTS Credits	Workload	
				Class Hours	Self-study Hours
Dept. Core	Cellular Biophysics* (BIOL 791)	BIOL	8	45	155
	Applied Bioinformatics* (BIOL 780)	BIOL	8	45	155
	Thesis Research (BIOL 799)	BIOL	0	0	30
Dept. Elective	Graduate Elective Course 2	All**	8	45	155
	Graduate Elective Course 3	All**	8	45	155
SEMESTER SUBTOTAL:			32	180	650

(*) Course may be waived for NU graduates and replaced by a Level-8 course (core or elective) selected by the student's supervisory committee and approved by the corresponding departmental committee. |

(**) All participating schools and departments with Level-8 courses



Sample Schedule (3)

Year 1: Summer Term (1 st Summer Term)					
Course		Academic Unit	ECTS Credits	Workload	
				Class Hours	Self-study Hours
Research	Thesis Research (BIOL 799)	BIOL	0	0	400
SEMESTER SUBTOTAL:			0	0	400

Year 2: Fall (3 rd Semester)					
Course		Academic Unit	ECTS Credits	Workload	
				Class Hours	Self-study Hours
Research	Thesis Research (BIOL 799)	BIOL	0	0	720
SEMESTER SUBTOTAL:			0	0	720

Sample Schedule (4)

Year 4: Spring (8 th Semester)					
Course	Academic Unit	ECTS Credits	Workload		
			Class Hours	Self-study Hours	
Dept. Core Doctoral Thesis (BIOL 800) (Thesis Research (BIOL 799))*	BIOL	180 (0)*	0	720	
SEMESTER SUBTOTAL:		180 (0)*	0	720	

*If not submitted and defended



Program Completion Requirements (1)

1. **Complete all required coursework (core, electives, research) in the program.** All PhD students are required to achieve continuously, during the Ph.D. degree program, a **CGPA of 2.67 (B-)** or higher to satisfy progression requirements and maintain their normal status in the program. Failing to maintain the required CGPA condition may place the student on probation. Any student with a CGPA of under 2.67 for two consecutive semesters will be recommended for dismissal from the program.



Program Completion Requirements (2)

- 2. Pass the Comprehensive Exam by the end of the first academic year.** The comprehensive exam shall determine if the student has the knowledge base to continue to the research phase of the Ph.D. program consisting of the thesis proposal and defense, research, thesis submission, and thesis defense. **The oral examination covers the topics of two core and two elective courses: BIOL 720 Statistical Methods in Life Sciences, BIOL 750 Structural and Molecular Biology in Health and Disease and two Department Electives** selected by the student's supervisory committee, which are in alignment with his/her research interests/topic.
- 3. Complete two Graduate Teaching Assistant (GTA) appointments which require a maximum of 10 h/week commitment per semester or summer term during the first two years.**

Program Completion Requirements (3)

- 4. Pass the oral Thesis Proposal Defense at the latest by the end of the third semester in the second academic year.**
- 5. Successfully complete the period progress review as part of BIOL 799 Thesis Research every semester term in the form of a seminar and/or progress report.**
6. Conduct the necessary research towards the completion of BIOL 799 Thesis Research
- 7. Write the Doctoral Thesis (BIOL 800) according to the Department's Ph.D. Thesis Format and Style Guidelines.**
- 8. Provide proof of a minimum of three published and/or submitted papers, where at least one original research paper as first author must be published, in press or accepted for publication by the time of requesting thesis submission for examination.**
9. Approval of the Doctoral Thesis by the internal and external reviewers.
- 10. Pass the Thesis Defense.**

Student Financial Assistance (1)

NU Stipend for Assisting Research Students

- NU StARS awards are provided to Ph.D. students as **baseline stipend** according to the amounts **determined by internal NU decisions and/or documents**.
- NU StARS monthly payment amounts to the student are subject to annual revision and approval by the NU Managing Council.
- **All Ph.D. students are required to complete a minimum of two, one-semester, GTA appointments**, normally in the first program year.
- NU StARS awards are **restricted to Ph.D. students who are currently registered in a NU PhD program, have active status, and hold a current GA or GTA**.
- NU StARS awards are **normally limited to the standard Ph.D. program duration**.