



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 19.04.01

Educational Programme "Cell and Molecular Biotechnology"

Trajectories: "Biotechnology and Bioengineering", "Biotechnology and Biomedicine", "Plant Biotechnology"

Implementing unit: Faculty of Biology and Biotechnology, HSE - Moscow

Years of Study: 2024/2025 - 2025/2026

Length of Programme: 2 years

Mode of Study: Full Time

Degree: Master's degree / MBA

APPROVED

26.04.2024

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Block Code	Course	Subject type	Credits	Credits by Years		Planned Educational Programme Development Results
				1	2	
	Degree Programme		120,00	60,00	60,00	
	Biotechnology and Biomedicine (Research track)		120,00	60,00	60,00	
	Key Seminars		39,00	24,00	15,00	
1	Research seminar "Management in the Field of biotechnology"	C	9,00	9,00		GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, PC-5, PC-7, PC-8, UC-1, UC-2, UC-3, UC-6
2	Scientific research seminar "Patenting"	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3, UC-5
3	Research seminar "Ethical Aspects of modern Research"	C	3,00		3,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, PC-5, PC-6, PC-8, UC-1, UC-3, UC-5
4	Scientific Research Seminar "Theory of Intercultural Communication" (offered in a foreign language)	C	6,00	3,00	3,00	GPC-7.BIT, PC-4, UC-1, UC-5, UC-6
5	Mentor's seminar "Biotechnology and Biomedicine"	C	15,00	12,00	3,00	GPC-1.BIT, GPC-4.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-6
	Internship		21,00	9,00	12,00	
	Project Internship					
	Professional Internship					
	Research Internship		21,00	9,00	12,00	
1	Research Internship	C	9,00	9,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, PC-1, PC-3, PC-6, UC-1, UC-2, UC-3

2	Research Internship	C	9,00		9,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, PC-3, PC-4, PC-6, UC-1, UC-2, UC-3, UC-4
3	Preparation of the final qualifying work	C	3,00		3,00	GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, GPC-7.BIT, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3
Major			48,00	27,00	21,00	
1	Analysis of Biological Data using Neural Networks	C	6,00	6,00		GPC-1.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, GPC-8.BIT, PC-3, PC-4, PC-5, UC-1, UC-2, UC-4, UC-6
2	Modern Biochemistry	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, GPC-6.BIT, PC-1, PC-2, PC-3, PC-6, UC-1, UC-2, UC-4
3	Medical Biotechnology	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-7.BIT, PC-2, PC-3, PC-5, PC-8, UC-1, UC-3, UC-5, UC-6
4	Creation and development of a new biotechnological and pharmaceutical product	C	9,00	9,00		GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, PC-1, PC-3, PC-5, UC-1, UC-3, UC-5, UC-6
5	Modern Microbiology and Immunology	C	3,00		3,00	GPC-3.BIT, GPC-5.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-2, PC-3, UC-1, UC-2, UC-3
6	Cellular Biotechnology	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, PC-1, PC-2, PC-4, PC-6, UC-1, UC-3, UC-5
7	Molecular Medicine	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-3, UC-6
8	Genomic editing Technologies	C	6,00		6,00	GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, PC-3, PC-4, PC-5, PC-6, PC-8, UC-1, UC-2, UC-3, UC-5
Magolego			9,00		9,00	
1	All-university Pool MAGOLEGO Courses	E	9,00		9,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, PC-2, PC-3, PC-4, PC-5, UC-1, UC-3, UC-5
Final State Certification (FSC)			3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, GPC-7.BIT, PC-1, PC-3, PC-6, PC-7, UC-1, UC-3
Plant Biotechnology (Research track)			120,00	60,00	60,00	
Key Seminars			42,00	24,00	18,00	

1	Scientific research seminar "Phenomics"	C	6,00	6,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, PC-1, PC-2, PC-3, PC-5, PC-6, UC-1, UC-2, UC-3, UC-4
2	Scientific research seminar "Marker Genomic Plant Breeding"	C	3,00	3,00		GPC-1.BIT, GPC-3.BIT, PC-1, PC-2, PC-3, PC-5, PC-6, UC-1, UC-2, UC-3, UC-4
3	Scientific research seminar "Patenting"	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, GPC-8.BIT, PC-4, PC-5, PC-8, UC-1, UC-2, UC-3
4	Scientific Research Seminar "Theory of Intercultural Communication" (offered in a foreign language)	C	6,00	3,00	3,00	GPC-1.BIT, GPC-3.BIT, GPC-7.BIT, PC-4, PC-7, PC-8, UC-1, UC-2, UC-3, UC-6
5	Mentor's seminar "Plant Biotechnology"	C	21,00	12,00	9,00	GPC-1.BIT, GPC-3.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3
	Internship		24,00	12,00	12,00	
	Research Internship		24,00	12,00	12,00	
1	Research Internship	C	6,00	6,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3, UC-4
2	Work Experience Internship (Research)	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3, UC-5
3	Internship. Research Activities	C	9,00		9,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-6.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-2, UC-3
4	Preparation of the final qualifying work	C	3,00		3,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, PC-1, PC-2, PC-3, PC-5, UC-1, UC-2, UC-3
	Major		42,00	24,00	18,00	
1	Plant Physiology	C	6,00	6,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3, UC-4
2	The Genetic Basis of Breeding	C	6,00	6,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-6.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-2, UC-3, UC-4
3	Biochemistry of the Plant Cell	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-3
4	Molecular Genetics of Plants	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-6.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3

5	Plant Proteomics	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, PC-2, PC-5, PC-7, UC-1, UC-2, UC-3
6	Plant Bioinformatics	C	6,00		6,00	GPC-1.BIT, GPC-5.BIT, GPC-6.BIT, GPC-8.BIT, PC-3, PC-5, PC-6, PC-7, UC-1, UC-3, UC-4, UC-5
7	Technologies of genomic editing of Plants	C	6,00		6,00	GPC-1.BIT, GPC-4.BIT, GPC-6.BIT, GPC-8.BIT, PC-3, PC-5, PC-6, UC-1, UC-2, UC-3
	Magolego		9,00		9,00	
1	All-university Pool MAGOLEGO Courses	E	9,00		9,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, GPC-6.BIT, PC-1, PC-2, PC-3, PC-4, UC-1, UC-2, UC-3, UC-6
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.BIT, GPC-2.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-8, UC-1, UC-2, UC-3, UC-4
	Biotechnology and Bioengineering (Research track)		120,00	60,00	60,00	
	Key Seminars		39,00	24,00	15,00	
1	Research seminar "Management in the Field of biotechnology"	C	9,00	9,00		GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3, UC-5
2	Scientific research seminar "Patenting"	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-4, PC-6, UC-1, UC-2, UC-3, UC-4
3	Research seminar "Ethical Aspects of modern Research"	C	3,00		3,00	GPC-1.BIT, GPC-3.BIT, GPC-7.BIT, PC-4, PC-6, UC-2, UC-3, UC-4, UC-5
4	Scientific Research Seminar "Theory of Intercultural Communication" (offered in a foreign language)	C	6,00	3,00	3,00	GPC-4.BIT, GPC-7.BIT, PC-4, UC-5
5	Mentor's seminar "Biotechnology and Bioengineering"	C	15,00	12,00	3,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, GPC-8.BIT, PC-1, PC-3, PC-4, PC-5, UC-1, UC-3, UC-5, UC-6
	Internship		21,00	9,00	12,00	
	Project Internship					
	Professional Internship					
	Research Internship		21,00	9,00	12,00	
1	Research Internship	C	9,00	9,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3, UC-4
2	Research Internship	C	9,00		9,00	GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, GPC-6.BIT, PC-1, PC-3, PC-6, UC-1, UC-2, UC-3, UC-4

3	Preparation of the final qualifying work	C	3,00		3,00	GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, GPC-7.BIT, GPC-8.BIT, PC-1, PC-3, PC-5, UC-1, UC-2, UC-3, UC-5
	Major		48,00	27,00	21,00	
1	Analysis of Biological Data using Neural Networks	C	6,00	6,00		GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, PC-2, PC-3, PC-4, UC-1, UC-2, UC-3, UC-5
2	Modern Biochemistry	C	6,00	6,00		GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, PC-3, PC-5, UC-1, UC-3, UC-5
3	Medical Biotechnology	C	6,00	6,00		GPC-1.BIT, GPC-4.BIT, GPC-6.BIT, PC-1, PC-3, UC-1, UC-2, UC-3
4	Creation and development of a new biotechnological and pharmaceutical product	C	9,00	9,00		GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, PC-1, PC-3, PC-5, UC-1, UC-3, UC-4, UC-6
5	Modern Microbiology and Immunology	C	3,00		3,00	GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, PC-1, PC-3, PC-4, PC-6, UC-1, UC-2, UC-3, UC-4
6	Cellular Biotechnology	C	6,00		6,00	GPC-1.BIT, GPC-2.BIT, GPC-4.BIT, GPC-5.BIT, PC-1, PC-2, PC-3, UC-1, UC-2, UC-3
7	Molecular Medicine	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-6.BIT, GPC-8.BIT, PC-2, PC-3, PC-5, UC-1, UC-3, UC-6
8	Genomic editing Technologies	C	6,00		6,00	GPC-1.BIT, GPC-3.BIT, GPC-5.BIT, GPC-6.BIT, GPC-8.BIT, PC-1, PC-3, PC-4, UC-1, UC-2, UC-3, UC-4
	Magolego		9,00		9,00	
1	All-university Pool MAGOLEGO Courses	E	9,00		9,00	GPC-1.BIT, GPC-2.BIT, GPC-3.BIT, GPC-5.BIT, PC-2, PC-3, PC-5, UC-1, UC-2, UC-3
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1.BIT, GPC-3.BIT, GPC-4.BIT, GPC-5.BIT, GPC-6.BIT, PC-2, PC-4, PC-5, PC-6, UC-3, UC-4, UC-6

Curriculum agreed:

Academic Supervisor

TONEVITSKIY A.G.

23.04.2024

Dean

TONEVITSKIY A.G.

23.04.2024

Head of Centre for
Educational Model Design

LEPESHKIN I.A.

25.04.2024

* Subject type:

Compulsory course

C

Elective course

E