

Biology, Specialization: Molecular Biology (MSc) – study schedule

(Language of instruction: English)

Symbols: Lab – Laboratory, K – Tutorial, S – Seminar); E – exam, Pg – pass with grade; O – obligatory course, E – elective course

The same number of superscripts (1,2,3) indicates leading obligatory course and two elective courses (one of them must be chosen). Elective courses extend and deepen significantly the topics covered in the leading obligatory course.

1st semester

Courses	No. of hours	Lecture	Classes	Form of course completion	Credits ECTS	
					O	E
Advanced molecular biology ¹⁾	60	20	40 (Lab)	E	5	-
Molecular microbiology ²⁾	60	20	40 (Lab)	E	5	-
Advanced biochemistry	60	20	40 (Lab)	E	5	-
Regulation of cellular processes	45	15	30 (Lab)	E	4	-
Analysis of biomolecules	45	-	45 (Lab)	Pg	4	-
Statistical methods in biology	30	-	30 (Lab)	Pg	2	-
Molecular evolution	15	15		Pg	1	-
Diploma seminar (1 module - Writing and presentation of scientific papers)	30		30 (S)	Pg	3	-
On-line trainings: Work Hygiene and Safety (4 hours), Ethics and Disciplinary Liability of Students (2 hours), Library Training (2 hours)	(8)	-	-		-	-
Total:	345 (+8)				29	-
					29	

2nd semester

Courses	No. of hours	Lecture	Classes	Form of course completion	Credits ECTS	
					O	E
Bioinformatics ³⁾	60	-	60 (Lab)	E	5	
A) Next-generation sequencing and beyond ³⁾ or B) Molecular modelling ³⁾	30	-	30 (Lab) 30 (Lab)	E	-	3
A) Microbial infectivity, drug resistance and diagnostics ²⁾ or B) Microbial genomics ²⁾	30	15 15	15 (Lab) 15 (Lab)	E	-	3
Innovations in environmental microbiology and sustainable development	15	15	-	Pg	1	-
Biochemical and molecular ecology	45	15	30 (Lab)	E	3	-
Other elective courses (2 to be chosen): 1. Human ecology 2. Animal and plant cell and tissue in vitro cultures 3. Vaccines and plasma-based preparations of therapeutic purpose 4. Host-pathogen interactions	30 30	-	-	Pg	-	3 3
Academic lecture	15	15		Pg	-	1
Foreign language	30		30 (K)	Pg	2	
Research project	100			Pg	7	
Total:	395				18	13
					31	



3rd semester

Courses	No. of hours	Lecture	Classes	Form of course completion	Credits ECTS	
					O	E
Molecular biology in entrepreneurship	15	-	15 (K)	Pg	1	-
A) Protein bioengineering ¹⁾ or B) Current topics in cell signaling ¹⁾	30	10 -	20 (Lab) 30 (K)	E	-	3
Elective courses in Humanities (two courses to be chosen from the given list)	60	60	-	Pg	-	4
Diploma seminar (II module)	30		30 (S)	Pg	3	-
Research project	120		120 (Lab)	Pg	8	-
Foreign language	30		30 (K)	E	2	-
Theme Module I or Module II Module I (<i>Molecular biology for environment and industry</i>) 1. Molecular mechanisms of adaptation 2. Biocatalysis and biotransformation Module II (<i>Molecular biology for medicine</i>) 1. Medical genetics and molecular diagnostics 2. Development of biomolecules with desired characteristics	45 45	15 15	30 (Lab) 30 (Lab)	Pg		4 4
Total:	375				14	15
					29	

4th semester

Courses	No. of hours	Lecture	Classes	Form of course completion	Credits ECTS	
					O	E
Synthetic biology	30	-	30 (K)	Ex	2	
Theme Module I or Module II Module I (<i>Molecular biology for environment and industry</i>) 1. Industrial microbiology 2. Biological control of plants Module II (<i>Molecular biology for medicine</i>) 1. Cellular and molecular immunobiology 2. Tumor biology	45 45	15 15	30 (Lab) 30 (Lab)	Pg	-	4 4
Diploma seminar (III module)	30	-	30 (S)	Pg	3	-
Research project	160	-	160 (Lab)	Pg	10	-
Diploma thesis and final exam					8	
Total:	310				23	8
					31	

