PLAN OF STUDIES - undergraduate studies (1. cycle) - full-time studies

Faculty **Energy and Environmental Engineering** **academic year 2019/2020**

Field of study **Biotechnology**

Profile of studies **Biotechnology in environmental protection**

COURSES (SUBJECTS) - SEMESTER	Total	Lecture	Classes	Seminar	Laboratory	Project	1 sem				2 sem					3 sem				4 sem				5 sem					6 sem					7 sem					ECTS							
							Lecture	Classes	Laboratory	Project	Lecture	Classes	Seminar	Laboratory	Project	Lecture	Classes	Laboratory	Project	Lecture	Classes	Laboratory	Project	Lecture	Classes	Seminar	Laboratory	Project	Lecture	Classes	Seminar	Laboratory	Project	Lecture	Classes	Seminar	Laboratory	Project	1	2	3	4	5	6	7	Σ
COMMON COURSES																																												
Foreign language	120	0	120	0	0	0		30				30					30				30																2	2	2	2				8
Physical education	60	0	60	0	0	0		30				30																																0
Humanistic subject - elective*	60	45	0	15	0	0	15				30		15																									1	3						4
Intelectual property protection	15	15	0	0	0	0	15																															1							1
Communication skills	30	15	15	0	0	0	15	15																														2							2
Mathematics	150	60	90	0	0	0	30	60			30	30																										8	6						14
Physics	60	30	15	0	15	0					30	15		15																									6							6
IT and introduction to programming (IT + Informatics)	60	15	0	0	45	0	15		45																													5							5
Engineering graphics	60	15	0	0	30	15	15		30						15																							5	2						7
Problem seminar**	15	0	0	15	0	0							15																										2							2
Selected engineering problems***	180	90	45	0	45	0	30	15	15		60	30		30																								6	9						15
BASIC COURSES																																												
Molecular biology and genetic	90	60	0	0	30	0										60		30																					7						7
Organic chemistry	105	30	30	0	45	0										30	30	45																					7						7
Hydraulics	30	15	15	0	0	0										15	15																					3						3
Physical chemistry	30	30	0	0	0	0										30																					2						2
Informatics	60	30	0	0	30	0																		30			30												4				4
Biology of cells and genetic engineering	60	30	0	0	30	0														30		30																		5				5
Biostatistics and biometry	60	30	15	0	15	0										30	15	15																					4						4
Biotechnology in environmental protection	60	30	0	0	30	0																		30			30													4				4
Biochemistry	90	60	0	0	30	0														30				30			30													2	4			6
Basics of bioinformatics	30	15	0	0	15	0														15		15																		2				2
Applied molecular biology	30	30	0	0	0	0																		30																	2			2
Basics of biotechnology	60	15	0	0	45	0														15		45																		4				4
Bioprocedural engineering	60	45	15	0	0	0														45	15																			5				5
Industrial microbiology	60	30	0	0	30	0														30		30																		5				5
Procedural engineering	90	60	30	0	0	0														60	30																			5				5
Enzymology	45	30	0	15	0	0																							30		15										5			5
DIRECTIONAL COURSES																																												0
Thermal processess in biotechnology	60	30	30	0	0	0										30	30																								5				5
Methods of physical-chemical measurements	60	15	0	0	45	0																		15			45														4			4
Biosystems modelling	90	45	15	0	30	0																		30	15				15			30									3	4		7
Instrumental analysis	30	30	0	0	30	0																		30			30														3			3
Wastewater biotechnology	75	30	0	0	45	0																		30			45														5			5
Gas treatment	15	15	0	0	0	0																		15																	1			1
Biotechnology of wastes	60	30	0	0	30	0																							30			30										5		5
Bioremediation of soil	75	30	0	0	45	0																							30			45										7		7
Biomonitoring and ecotoxicology	60	30	0	0	30	0																							30			30										5		5
Environmental analysis	30	15	0	0	0	15																												15				15					3	3
Student internship (4 weeks) after 6. sem.	0	0	0	0	0	0																																					4		4
Environment and organisms interactions	30	30	0	0	0	0																												30									3	3
Tissues cultures	60	30	0	0	30	0																												30			30						4	4
Specialization seminar (BA)	30	0	0	30	0	0																														30								5	5
Engineering project	45	0	0	0	0	45																																45						15	15
Number of hours/ per week	2490	1155	495	75	720	75	135	150	90	0	150	135	30	45	15	195	120	90	0	225	75	120	0	240	15	0	210	0	135	0	15	135	0	75	0	30	30	60							
Total number of hours in semester							**375**				**375**					**405**				**420**				**465**					**285**					**195**											
Total number hours per week							**25**				**25**					**27**				**28**				**31**					**19**					**13**											
Total number of ECTS																																							30	30	30	30	30	30	30	210
Exams							**0**				**0**					**2**				**4**				**2**					**4**					**0**											

*Elective subject (e.g. Ergonomy and safety issues, History of biotechnology)

**Environmental protection

*** Chemistry (30h lectures 15h classes and 15h laboratory; semester 1); Good laboratory practice (30h lectures and 30h classes; semester 2); Microbiology and environmental monitoring (30h lectures and 30h laboratory; semester 2)