

FACULTY OF CHEMICAL AND SYSTEM ENGINEERING

Specialty : Biotechnology

Professional qualification : Biotechnology engineer

code of discipline	COURSES	FULL-TIME STUDIES									Total credits	Total
		Semester	Course Loads					Total of self-training	Credits	Credits of self-training		
			Assessment	Teaching Loads			Total					
				Lectures	Laboratory work	Seminars						
1	2	3	4	5	6	7	8	9	10	11	11	13
b052	Mathematics – I part	I	E	45	0	45	90	135	3.6	5.4	9	225
b1001	Fundamentals of Design and CAD	I	T	15	30	0	45	68	1.6	2.4	4	113
b676	Informatics – I part	I	E	30	30	0	60	90	2.4	3.6	6	150
b111	Inorganic Chemistry – I part	I	E	30	9	21	60	90	2.4	3.6	6	150
b1198	Introduction to the Specialty	I	T	15	0	15	30	45	0.8	1.2	2	75
	<i>Humanitarian elective courses – one of the following:</i>											
b056	– Ecology and Technical Civilization	I	T	30	0	0	30	45	1.2	1.8	3	75
b066	– Engineering Psychology and Ergonomics	I	T	30	0	0	30	45	1.2	1.8	3	75
b1150	– Career Development and Entrepreneurship	I	T	30	0	0	30	45	1.2	1.8	3	75
b1000	Sports	I			60							
	Total for the semester:						315	473			30	788
b053	Mathematics – II part	II	E	45	0	45	90	135	3.6	5.4	9	225
b114	Inorganic Chemistry – II part	II	E	30	30	0	60	90	2.0	3.0	5	150
b344	Technical Mechanics	II	E	30	0	30	60	90	2.4	3.6	6	150
b414	Physics	II	E	30	30	0	60	90	2.4	3.6	6	150
b824	Informatics – II part	II	E	15	30	0	45	68	1.6	2.4	4	113
b1000	Sports	II			60							
	Total for the semester:						315	473			30	788
b115	Analytical Chemistry	III	E	25	25	0	50	75	1.6	2.4	4	125
b236	Organic Chemistry – I part	III	E	45	45	0	90	135	3.6	5.4	9	225
b313	Physical Chemistry	III	E	45	45	0	90	135	3.2	4.8	8	225
b325	Industrial Safety	III	T	20	25	0	45	68	1.6	2.4	4	113
b837	Statistical Methods	III	T	15	15	0	30	45	1.2	1.8	3	75

	<i>Electives – one of the languages:</i>											
b148	– English	III	–	0	30	0	30	45	0.8	1.2	2	75
b153	– Russian	III	–	0	30	0	30	45	0.8	1.2	2	75
b155	– French	III	–	0	30	0	30	45	0.8	1.2	2	75
b168	– German	III	–	0	30	0	30	45	0.8	1.2	2	75
b1000	Sports	III			30							
	Total for the semester:						335	503			30	838
b237	Organic Chemistry – II part	IV	E	30	30	0	60	90	2.0	3.0	5	150
b189	Instrumental Methods in Analytical Chemistry	IV	E	20	20	0	40	60	1.6	2.4	4	100
b196	Economics and Management	IV	E	25	0	25	50	75	1.6	2.4	4	125
b396	Electrical Engineering and Electronics	IV	E	30	30	0	60	90	2.0	3.0	5	150
b309	Colloid Chemistry	IV	T	20	20	0	40	60	1.6	2.4	4	100
b725	Biophysics	IV	E	30	30	0	60	90	2.0	3.0	5	150
	<i>Electives – one of the languages:</i>											
b148	– English	IV	T	0	30	0	30	45	1.2	1.8	3	75
b153	– Russian	IV	T	0	30	0	30	45	1.2	1.8	3	75
b155	– French	IV	T	0	30	0	30	45	1.2	1.8	3	75
b168	– German	IV	T	0	30	0	30	45	1.2	1.8	3	75
b1000	Sports	IV			30							
	Total for the semester:						340	510			30	850
	<i>Humanitarian elective courses – one of the following:</i>											
b138	– Communications in Social Systems	V	T	30	0	0	30	45	1.2	1.8	3	75
b139	– Organization Development and Staff Training	V	T	30	0	0	30	45	1.2	1.8	3	75
b232	Unit Operations	V	E	30	30	0	60	90	2.0	3.0	5	150
b432	Biochemistry	V	E	45	45	0	90	135	3.2	4.8	8	225
b870	Microbiology – part I	V	E	45	45	0	90	135	3.2	4.8	8	225
b1147	Instrumental Analysis in Biotechnologies	V	E	30	30	0	60	90	2.4	3.6	6	150
b1000	Sports	V			30							
	Total for the semester:						330	495			30	825
b029	Industrial Automation	VI	E	30	30	0	60	90	2.0	3.0	5	150
b399	Thermal Engineering	VI	E	20	20	0	40	60	1.2	1.8	3	100
b1208	Unit Operations in Biotechnological Industry	VI	E	30	30	0	60	90	2.4	3.6	6	150
b615	Bioorganic Chemistry	VI	E	30	30	0	60	90	2.4	3.6	6	150
b871	Microbiology – part II	VI	E	30	30	0	60	90	2.4	3.6	6	150
	<i>Elective courses – one of the following:</i>											
b1214	– 3D Modelling and Computer Simulation	VI	T	15	30	0	45	68	1.6	2.4	4	113
b1215	– Applied Physical Chemistry of Dispersed Systems	VI	T	15	30	0	45	68	1.6	2.4	4	113
b1216	– Chemistry of Elemental Organic Compounds	VI	T	15	30	0	45	68	1.6	2.4	4	113

b1217	– Characterization, Modelling and Simulation of Materials and Structures	VI	T	15	30	0	45	68	1.6	2.4	4	113
b1000	Sports	VI			30							
	Total for the semester:						325	488			30	813
b784	Molecular Biology and Genetics	VII	E	30	30	0	60	90	2.4	3.6	6	150
b708	Pharmaceutical Biotechnology	VII	E	30	30	0	60	90	2.0	3.0	5	150
b600	Biocatalysis	VII	E	30	30	0	60	90	2.4	3.6	6	150
b897	Industrial Biotechnology	VII	E	30	30	0	60	90	2.0	3.0	5	150
b121	Biotechnological Methods in Ecology	VII	E	30	30	0	60	90	2.0	3.0	5	150
	<i>Project – one of the following:</i>											
b1218	- A Project on Microbiology	VII	D	0	0	30	30	45	1.2	1.8	3	75
b1219	- A Project on Instrumental Analysis in Biotechnology	VII	D	0	0	30	30	45	1.2	1.8	3	75
b1220	- A Project on Industrial Biotechnology	VII	D	0	0	30	30	45	1.2	1.8	3	75
b1221	- A Project on Biotechnological Methods in Ecology	VII	D	0	0	30	30	45	1.2	1.8	3	75
	Total for the semester:						330	495			30	825
b883	Immunology	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b215	Fundamentals of Genetic Engineering	VIII	E	30	30	0	60	90	2.0	3.0	5	150
	<i>Elective courses – two of the following:</i>											
b779	– Technology of Biotransformations	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b480	– Biomaterials and Biocompatibility	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b025	– Biosensors and Biosensor Technics	VIII	E	30	30	0	60	90	2.0	3.0	5	150
1026	– Technology of Microbial Protein Products	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b720	– Biotechnological Products of Microalgae	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b619	– Biotechnology in Food Production	VIII	E	30	30	0	60	90	2.0	3.0	5	150
b1175	– Technology of Wine	VIII	E	30	30	0	60	90	2.0	3.0	5	150
	Total for the semester:						240	360			20	600
b1022	Practice in Industry		D				200					
	BSc Thesis – 8 weeks	VIII	D								10	
	Total for the entire period of education:						2530				240	