

Table 7. Curriculum of the bachelor's DP 6B05210 Ecology

1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 trimester	8 trimester	9 trimester
<p>M 1</p> <p>History of Kazakhstan</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>State exam</p>	<p>M 8</p> <p>Kazakh (Russian) language</p> <p>3 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>M 15</p> <p>Philosophy</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>M 23.1</p> <p>Ecosystem and Law</p> <p>4 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M 23.2</p> <p>Entrepreneurship and financial literacy</p> <p>4 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>M30.1</p> <p>Standardization, certification and metrology</p> <p>2 lectures</p> <p>1 practical class</p> <p>4 ECTS</p> <p>Exam</p> <p>or</p> <p>M30.2</p> <p>Systems of technical regulation and Providing of Unity of Measurement</p> <p>2 lectures</p> <p>1 practical class</p>	<p>M 36.1</p> <p>Engineering economics</p> <p>2 lectures</p> <p>1 practical class</p> <p>4 ECTS</p> <p>Exam</p> <p>or</p> <p>M 36.2</p> <p>Organization of production and management</p> <p>2 lectures</p> <p>1 practical class</p> <p>4 ECTS</p> <p>Exam</p>	<p>M 41.1</p> <p>Green construction</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M 41.2</p> <p>Ecoanalytics in construction</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>M 45.1</p> <p>Geographic information systems in ecology</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M 45.2</p> <p>Modeling in ecology</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>M 49</p> <p>Pre-graduation or industrial practice</p> <p>10 ECTS</p> <p>Report defense</p>

				4 ECTS Exam				
M 2.1 Abay study 1 lecture 1 practical class 3 ECTS Differentiated pass or M 2.2 Mukhtar studies 1 lecture 1 practical class 3 ECTS Differentiated pass or M 2.3 Foundations	M 9 Foreign language 3 practical classes 5 ECTS Exam	M 16 Social and political science 1 lecture 2 practical classes 4 ECTS Exam	M 24 Physical culture 2 practical classes 2 ECTS Differentiated pass	M 31 Geoecology and nature conservation 2 lectures 2 practical classes 5 ECTS Exam	M 37.1 Fundamentals of environmental regulation and expertise 2 lectures 1 practical class 4 ECTS Exam or M 37.2 Environmental assessment and audit at the production site 2 lectures 1 practical class 4 ECTS Exam	M 42.1 Emissions into the environment and their calculation 2 lectures 2 practical classes 5 ECTS Exam or M42.2 Standardization of emissions into the environment 2 lectures 2 practical classes 5 ECTS Exam	M 46.1 Planning and organization of research projects 2 lectures 2 laboratory classes 1 practical class 6 ECTS Exam or M 46.2 Fundamentals of Scientific Research and Patent Law 2 lectures	M 50 Bachelor's thesis 8 ECTS Defense of a bachelor's thesis or 2 comprehensive exams

of Anti-Corruption Culture 1 lecture 1 practical class 3 ECTS Differentiated pass or M 2.4 Fundamentals of Artificial Intelligence 1 lecture 1 practical class 3 ECTS Differentiated pass							2 laboratory classes 1 practical class 6 ECTS Exam	
M 3 Kazakh (Russian) language	M 10 Physical culture	M 17 Cultural studies and psychology	M 25.1 Ecology and sustainable development	M 32.1 Industrial ecology 2 lectures	M 38 Industrial practice II 6 ECTS	M 43.1 Air basin protection 2 lectures	M 47.1 Fundamentals of environmental law	

<p>3 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>2 practical classes</p> <p>2 ECTS</p> <p>Differentiated pass</p>	<p>1 lecture</p> <p>2 practical classes</p> <p>4 ECTS</p> <p>Exam</p>	<p>1 lecture</p> <p>1 practical class</p> <p>3 ECTS</p> <p>Exam</p> <p>or</p> <p>M 25.2</p> <p>Ecological aspects of natural science</p> <p>1 lecture</p> <p>1 practical class</p> <p>3 ECTS</p> <p>Exam</p>	<p>1 laboratory class</p> <p>1 practical class</p> <p>5 ECTS</p> <p>exam</p> <p>or</p> <p>M32.2</p> <p>Integrated management system for environmental protection</p> <p>2 lectures</p> <p>1 laboratory class</p> <p>1 practical class</p> <p>5 ECTS</p> <p>exam</p>	<p>Report defense</p>	<p>1 laboratory class</p> <p>2 practical classes</p> <p>6ECTS</p> <p>Exam</p> <p>or</p> <p>M43.2</p> <p>Assessment of environmental and economic efficiency of production</p> <p>2 lectures</p> <p>1 laboratory class</p> <p>2 practical classes</p> <p>6ECTS</p> <p>Exam</p>	<p>in environmental management</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M 47.2</p> <p>Environmental legislation of the Republic of Kazakhstan</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>	
M 4	M 11 Information and	M 18	M 26.1	M 33.1 Industrial wastewater	M 39	M 44.1 Resource-saving, low-waste and	M 48.1 Environmental	

Foreign language 3 practical classes 5 ECTS Exam	communication technologies 2 lectures 2 laboratory classes 5 ECTS Exam	Physical culture 2 practical classes 2 ECTS Differentiated pass	Ecology of Animals, Plants and Biogeography 2 lectures 2 practical classes 5 ECTS Exam or M26.2 Landscape Science with Basics of Ecology 2 lectures 2 practical classes 5 ECTS Exam	treatment technology 2 lecture 1 laboratory class 2 practical classes 6 ECTS Term paper, Differentiated pass or M 33.2 Municipal wastewater treatment 2 lecture 1 laboratory class 2 practical classes 6 ECTS Term paper,	Climate Change and Green Economy 2 lecture 1 practical class 4 ECTS Exam	waste-free technologies 2 lecture 2 practical classes 5 ECTS Exam or M 44.2 Green technologies for recycling household waste 2 lecture 2 practical classes 5 ECTS Exam	protection technology 2 lecture 2 practical classe 5 ECTS Exam or M 48.2 Economic and environmental assessment of enterprise activities 2 lecture 2 practical classe 5 ECTS Exam	
--	---	---	--	--	---	---	---	--

				Differentiated pass				
M 5 Physical Training 2 practical classes 2 ECTS Differentiated pass	M 12.1 Higher Mathematic 2 lectures 2 practical classes 5 ECTS Exam or M 12.2 Theory of Probability and Mathematical Statistics 2 lectures 2 practical classes 5 ECTS Exam	M19 Professional Kazakh (Russian) language 2 practical classes 3 ECTS Exam	M27.1 Bioindication research methods in ecology 2 lectures 2 laboratory classes 1 practical class 6 ECTS Exam or M27.2 Agroecology 2 lectures 2 laboratory classes 1 practical class 6 ECTS Exam	M34.1 Integrated use and protection of water resources 2 lectures 2 practical classes 5 ECTS Exam or M34.2 Water purification equipment and technology 2 lectures 2 practical classes 5 ECTS Exam	M 40 Disciplines for additional degree programmes (Minor Disciplines) 12 ECTS			
M6.1	M13.1	M20	M 28	M 35.1				

<p>Physics</p> <p>2 lectures</p> <p>2 laboratory classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M6.2 Fundamentals of Quantum Mechanics</p> <p>2 lectures</p> <p>2 laboratory classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>General biology</p> <p>2 lectures</p> <p>2 laboratory classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M 13.2 Origin and Development of Biosphere</p> <p>2 lectures</p> <p>2 laboratory classes</p> <p>5 ECTS</p> <p>Exam</p>	<p>Professionally-oriented foreign language</p> <p>2 practical classes</p> <p>3 ECTS</p> <p>Exam</p>	<p>Industrial practice I</p> <p>4 ECTS</p> <p>Report defense</p>	<p>Contemporary urban problems and urban ecology</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M35.2 Social ecology and sustainable development</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>				
<p>M7.1</p> <p>General chemistry</p> <p>1 lecture</p>	<p>M14.1</p> <p>Introduction the specialty</p> <p>2 lectures</p>	<p>M21.1</p> <p>Soil science with basics of ecology</p> <p>2 lectures</p>	<p>M29.1</p> <p>Environmental monitoring</p> <p>2 lectures</p>					

<p>2 laboratory classes</p> <p>4 ECTS</p> <p>Exam</p> <p>or</p> <p>M 7.2</p> <p>Theoretical foundations of inorganic chemistry</p> <p>1 lecture</p> <p>2 laboratory classes</p> <p>4 ECTS</p> <p>Exam</p>	<p>1 practical class</p> <p>4 ECTS</p> <p>Differentiated pass</p> <p>or</p> <p>M14.2</p> <p>Fundamentals of Academic Writing</p> <p>2 lectures</p> <p>1 practical class</p> <p>4 ECTS</p> <p>Differentiated pass</p>	<p>1 practical class</p> <p>4 ECTS</p> <p>Differentiated pass</p> <p>or</p> <p>M21.2</p> <p>Environmental problems of agricultural areas</p> <p>2 lectures</p> <p>1 practical class</p> <p>4 ECTS</p> <p>Differentiated pass</p>	<p>1 practical class</p> <p>1 laboratory class</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M29.2</p> <p>Environmental monitoring of enterprises</p> <p>2 lectures</p> <p>1 practical class</p> <p>1 laboratory class</p> <p>5 ECTS</p> <p>Exam</p>					
		<p>M 22.1</p> <p>Environmental resource science and nature management</p> <p>2 lectures</p>						

		<p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p> <p>or</p> <p>M22.2</p> <p>Ecological design in the field of environmental protection</p> <p>2 lectures</p> <p>2 practical classes</p> <p>5 ECTS</p> <p>Exam</p>						
<p>Σ6 lectures + 4 laboratory classes + 13 practical classes = 23 hours/week</p>	<p>Σ8 lectures + 4 laboratory classes + 11 practical classes = 23 hours/week</p>	<p>Σ8 lectures + 15 practical classes = 23 hours/week</p>	<p>Σ7 lectures + 3 laboratory classes + 11 practical classes = 21 hours/week</p>	<p>Σ12 lectures + 2 laboratory classes + 10 practical classes = 24 hours/week</p>	<p>Σ6 lectures + 3 practical classes = 9 hours/week</p>	<p>Σ8 lectures + 1 laboratory classes + 8 practical classes = 17 hours/week</p>	<p>Σ8 lectures + 2 laboratory classes + 7 practical classes = 17 hours/week</p>	

5 exams, 2 - differentiated pass	5 exams, 2 - differentiated pass	6 exams, 2 - differentiated pass	5 exams, 1 - differentiated pass, 1 practice report	5 exams, 1 - differentiated pass	3 exams, 1 practice report,	4 exams	4 exams	1 practice report, 1 final bachelor's thesis or 2 comprehensive exams
29 ECTS	31 ECTS	30 ECTS	30 ECTS	30 ECTS	30 ECTS	21 ECTS	21 ECTS	18 ECTS
Total								240 ECTS
Elective component 12 ECTS (41%)	Elective component 14 ECTS (45,1 %)	Elective component 9 ECTS (30%)	Elective component 24 ECTS (80%)	Elective component 25 ECTS (83,3%)	Elective component 18 ECTS (60 %)	Elective component 15 ECTS (100%)	Elective component 20 ECTS (100%)	
Total								137 ECTS (57%)
Laboratory classess 4 hours/week	Laboratory classess 4 hours/week	Laboratory classess - hours/week	Laboratory classess 3 hours/week	Laboratory classess 2 hours/week	Laboratory classess - hours/week	Laboratory classess 1 hour/week	Laboratory classess 2 hours/week	

Total								16 hours/week (10%)
-------	--	--	--	--	--	--	--	---------------------------