

Educational program in a direction Ecology

1. *The brief description of a thematic direction.*

Ecological education becomes a priority direction of the state strategy of steady development of Kyrgyzstan. It should promote the solution of environmental problems by the population of the country in quickly varying conditions of an environment. Such education should form socially-ecological outlook, legal positions, a complex of scientific knowledge, ability to embody knowledge in practice that demands revision of a condition of education system. Without overcoming exclusively consumer attitude to the nature it cannot be solved environmental problems, it cannot be saved a society from physical and spiritual degradation. Transition to ecology modeling of economy and manufactures is necessary, for the postindustrial ecologically focused civilization that causes formation of system of the knowledge constructed on a uniform theoretical basis and leaving out of traditional frameworks of differentiated sciences about the nature. The new system of knowledge should help to the future experts to organize human activity in conditions of a rigid ecological imperative.

In conditions of globalization of economy there is a necessity of creation of uniform educational space with revision of educational programs. So, in a direction "Ecology" there was an objective necessity of reorganization of educational programs in view of requirements of employers of the international labour market to graduates of ecological directions on the basis of the general and specific competences. Below there is the new program on ecological issue, developed by a commission of experts: the academic community (International University of Kyrgyzstan, Kyrgyz State University of Construction and Architecture, Osh Technical University, Jalal-Abad State University, Naryn State University, Issyk-Kul State University); employers; graduates of high schools.

2. *Specialization and employment*

Typical Employment of graduates of ecological specialities (map of professions)

Cycle	Employment		
	Subject	Professional field	Examples og professions
The first	Ecology	Industry, NGO (an ecological structure)	Expert - ecologist
	Nature management Ecology of fround Ecology of animals and plants Ecological management Engineering protection of an environment	Industry, an agriculture, Scientific research institute, customs service, wood service, Departments at the Ministry of Emergency Measures, State agency on protection of environment and a forestry	Expert - ecologist, engineer – ecologist, inspector of preservation of environment, employee of nature protection establishments, laboratorian
The second	Ecology and education	Education	Teacher, NGO
	Ecological examination	The Industry, education, civil service, NGO	Expert, teacher, adviser - expert
	Monitoring of the environment	State agencies on the environment issue , Regional management of preservation of the environment, regional	Expert, adviser in management, scientific employee in scientific research institute

		managements on a forestry and the hunting supervision, regional fund of wildlife management, the State control on vegetative and fauna, timber enterprises, forest areas, wood farms	
	Ecology and education	education	Teacher of higher educational institutions
	Ecological management, Management in it is mountain-mining industry	Industry Education State institutions Civil service	Adviser in management, manager – ecologist, scientific employee, geoecologist
	Legal bases of wildlife management, Engineering protection in ecology, Applied ecology	State institutions, Civil service: Ministry of Emergency, Legal consulting firms, Industrial construction, power engineering	Ecologist-jurist, engineer-ecologist
The third	Ecology of water resources, Ecology of ground resources, Ecology of wood resources, Ecology anthropogenesis ecosystems, Ecology of mountain territories Applied ecology	State institutions Civil service The industry Scientific research institutes Education Private expert services	Independent expert researcher/ecologist manager-ecologist adviser in management researcher/teacher, engineer-ecologist

3. Results of training and the competence - the description on cycles (what main things of the competence for the first and the second cycle)

The first cycle

The general:

Should know and be able

1. Correctly to put problems, to make the analysis of a situation and to make the effective solution of a problem;
2. Competently to state the ideas, the developed measures and programs in the written and oral form;
3. To defend and advance the ideas;
4. Effectively to use means of information technologies for presentations of projects;
5. To show cognitive skills of critical thinking;
6. Skill to make correct conclusions;
7. On the basis of standard decisions to find a way out from a situation in concrete conditions;
8. Effectively and rationally to organize the working day;
9. To carry out effective activity in public, including: leadership and creation of a command;
10. To listen, convince and negotiate;
11. Competently to build attitudes on the basis of psychological typology of the person;
12. The Main aspects of history of fatherland, ethical and cultural knowledge;
13. The State, official and foreign languages.

Specific

Should know:

1. Substantive provisions of the general ecology;
2. Principles of rational wildlife management;

3. Main principles and laws of functioning ecosystem;
4. Base principles of the industrial and agrarian right, the economic right;
5. Normative-legal statuses of KR on ecology and protection of an environment;
6. Basic elements of social ecology and demography;
7. Key rules and methods of monitoring of an environment;
8. The Basic ways of processing of statistical data;
9. Systems of accommodation of natural resources both the basic industrial and non-productive funds of the state;
10. The Basic ways and methods of engineering protection of an environment;
11. Bases of ecologic-economic regulation and systems of payments for natural resources and for environmental contamination in Kyrgyzstan and abroad;
12. The General principles of decision-making in the field of wildlife management of governmental and public organizations;
13. Ecological situations and problems in Kyrgyzstan;
14. To use theoretical bases of management of natural objects in the form of geographical components of geosystems of a various level;
15. Main principles of system of accommodation, processing or a burial place of waste, including means and methods of monitoring and the control of influence over an environment;
16. Legal bases of protection of an animal and flora.

Should be able:

1. To use the basic tools of rational wildlife management;
2. To use the basic tools of the statistical analysis in the field of ecology and managements;
3. By means of information-communication technologies to be able to process and analyze a database;
4. Competently to make normative and legal documents on environmental problems;
5. To use normative-legal bases of management of wildlife management;
6. Competently to apply modern methods and means of protection of an environment;
7. To plan and carry out actions on wildlife management;
8. to solve engineering problems of preservation of the environment;
9. To possess methods of research and the analysis of chemical, physical and biological properties of natural resources;
10. To analyze local natural-climatic conditions and to develop corresponding effectual measures under the decision of a problem.

The second cycle

The student who has received a degree of the second level in a direction "Ecology" should:

1. To be able to use methods on bioindication and ecological examination of a condition natural and technogenic ecosystem;
2. To be able to analyze features of behavior of radioactive substances;
3. To be able to own methods of radiating safety;
4. To be able to predict consequences of anthropogenesis influences on an environment;
5. To be able to develop recommendations on rational use and protection of natural resources;
6. To be able to reveal problems of ecological character at the analysis of concrete situations, to offer ways of their decision and to estimate expected results;
7. To be able to develop and prove variants of effective decisions;
8. To have skills independently to work in research;
9. To be able to use knowledge in pedagogical activity;
10. To be able to spend ecologic-economic examination of ecological projects;
11. To be able to carry out examination of the projects influencing on natural objects.

4. Loading and ECTS.

First cycle of ecology (ECTS-credits)						
1 st year 1 st semester	5 ECTS Biology	2 ECTS IT KIIB 3 ECTS Valeology	3 ECTS Maths 2 ECTS Physics	5 ECTS <i>Kyrgyz(russian) language</i>	Elected course(Humanitarian 2,5 ECTS Oratory 2,5 ECTS <i>History of Kyrgyzstan</i>	5 ECTS Chemistry
1 st year 2 nd semester	5 ECTS Ecology	2 ECTS IT 3 Elected course(Humanitarian) Sociology	2 ECTS Maths 3 ECTS Physics	5 ECTS <i>Kyrgyz(russian) language</i>	3 ECTS Philosophy 2 ECTS Geography	5 ECTS Chemistry
2 nd year 3 rd semester	5 ECTS Ecology of soil and microorganisms	3 ECTS IT Elected course (Humanitarian) 2 ECTS Ethics	2 ECTS Maths 3 ECTS Genetic aspects of ecology	5 ECTS <i>Kyrgyz(russian) language</i>	Elected course (general). 3 ECTS Study of hydrosphere 2 ECTS Study of atmosphere	5 ECTS Ecology of plants and animals
2 nd year 4 th semester	5 ECTS Organism and environment	3 ECTS IT Elected course (Humanitarian) 2 ECTS Culture of writing	5 ECTS Statistics	5 ECTS <i>Kyrgyz(russian) language</i>	Elected course (general). 5 ECTS Ecology of Kyrgyzstan	5 ECTS Microeconomics
3 rd year 5 th semester	5 ECTS Use of nature	3 ECTS IT 2 ECTS Personal psychology/Management of stuff	Special disciplines 5 ECTS Geocology	5 ECTS <i>Foreign language</i>	5 ECTS Management	5 ECTS Macroeconomics
3 rd year 6 th semester	5 ECTS Social ecology & geography of population	2 ECTS IT in ecology 3 ECTS <i>Introduction to biotechnology</i>	Practice 5 ECTS	5 ECTS <i>Foreign language</i>	5 ECTS Marketing in ecology	5 ECTS Ecology of man
4 th year 7 th	Special disciplines 5 ECTS	5 ECTS	Special disciplines	3 ECTS <i>Foreign language</i>	5 ECTS Ecology	

sem este r	Law principles in industry and agriculture	Qualification work	5 ECTS Theory of organization/ Finances	2 ECTS IT in ecology	mapping	5 ECTS Agrarian law
4 th year 8 th sem este r	Special disciplines 5 ECTS Environmental monitoring & control methods	Qualification work 5 ECTS	Practice 5 ECTS	3 ECTS <i>Foreign language</i> 2 ECTS IT	Special disciplines 5 ECTS Ecological expertise and risk	Special disciplines 5 ECTS Economics of use of nature

First cycle of ecology (ECTS-credits)						
1 st year 1 st semester	<i>Philosophical questions of natural science</i> 5	<i>Methodology of ecological management and marketing</i> 5	<i>Modern problems of ecology and nature management</i> 5	Qualification work 5 ECTS	<i>Languages</i> 10	<i>Seminars</i> 10
1 st year 2 nd semester	<i>IT in ecology</i> 5	<i>Ecological standardization and certification</i> 5	<i>Ecology modeling</i> 5	Qualification work 5 ECTS		
2 nd year 1 st semester	<i>Practice</i> 5	<i>Law/ pedagogics</i>	Qualification work 5 ECTS	<i>master's thesis</i>		
2 nd year 2 nd semester	Research Practice 15					

Specialization in a direction ecology:

1. Ecological management.

5 ECTS in each subject: Management in ecology, the Theory of the organization, the Economic right, Economy of wildlife management, Monitoring of an environment and a quality monitoring, Ecological examination and ecological risk.

2. Protection of an environment

5 ECTS in each subject: Bases of preservation of the environment, the Basis of a geodesy and cartography, Processes and devices of preservation of the environment, Engineering ecology, Bases of meteorology and климатологии.

3. The ecologist on preservation of a biodiversity

5 ECTS in each subject: The Biodiversity of the biosphere, Especially-protected natural territories, Methods of field researches, Ecological safety, Technogenic systems and ecological risk.

4. The ecologist-hydro broad gully.

5 ECTS in each subject Hydro ecology, Physical and chemical methods of the analysis, Industrial ecology, Ecological examination and designing, Especially-protected natural territories.

5. The Ecologist-soil scientist.

5 ECTS in each subject Ecological mapping, Radioecology, Agricultural ecology, Ecological forecasting, Especially-protected natural territories.

6. The engineer - the ecologist.

5 ECTS in each subject Clearing of city sewage, Industrial ecology, Processes and devices in ecology, Engineering protection of hydrosphere, Engineering protection of an atmosphere.

5. *Training, teaching and assessment.*

Lectures. The lecture material - includes great volume literary and experimental data, and also the advanced achievements which are not entering into textbooks. The task of the lecturer to state a problem in the form most accessible to the student, having structured knowledge necessary to the student.

Seminars. The solution of problems and revision of a theoretical material allow to fix the received knowledge.

Practical courses. Laboratory researches should be an obligatory component during training in the given direction. Such courses allow the student to apply theoretical knowledge in practice, to master methods of ecological researches for the decision of specific targets.

Individual academic year project. It is one of forms of the control of knowledge. Development of the project allows the student to apply independently the received knowledge and skills to the decision of a concrete ecological task. On the basis of theoretical knowledge will learn to predict development of a situation.

Course work - the written work covering a material of all or a part of a rate or the big section, confirming qualification of the student.

The abstract - the written work representing the review of any concrete question and own vision of a problem.

Examination to be spent in the written or oral form.

Research work means independent performance of researches under direction of the teacher. During performance of scientific work the student should use experimental methods, the statistical analysis and other ways of scientific methodology. Independent research work raises motivation of the student in achievement of result.

Manufacturing полупромышленных breadboard models.

6. Maintenance of quality: how to provide and reach{achieve} quality in the certain direction.

To achieve high education it is necessary for high school to have material base: stationary laboratory of the analysis of ground, water, air; mobile laboratory, computer classes with the necessary software, access to the Internet and multimedia library;

Qualified personnel; study-methodical works,

Regular carrying out of exams on disciplines of specialization;

Questioning of students for revealing quality of teaching and student overload;

Carrying out of the open lectures, seminars;

Computer presentations students;

Participation in scientifically-practical conferences, seminars;

Periodic passage by teachers the courses of improvement of qualification;

Competitive elections of teachers, certification of teachers.