Department “Georgaphy, Ecology and Environmental protection”

MASTER’S DEGREE PROGRAMME

„ECOLOGY AND ENVIRONMENTAL PROTECTION”

FIELD OF HIGHER EDUCATION:	4. NATURAL SCIENCES, MATHEMATICS AND INFORMATICS
PROFESSIONAL AREA :	4.4 EARTH SCIENCES
EDUCATION AND QUALIFICATION DEGREE:	MASTER’S DEGREE
PROFESSIONAL QUALIFICATION:	MASTER IN ECOLOGY AND ENVIRONMENTAL PROTECTION
PERIOD OF EDUCATION:	2 YEARS (4 SEMESTERS)
FORM OF EDUCATION:	FULL-TIME

The professional standards, curriculum and courses of the MA program "Ecology and Environmental Protection" are in accordance with the Higher Education Act and the regulations of the university. The total number of workload hours are 3600, which corresponds to 120 ECTS credits in accordance with state requirements. The Master's program is from the Professional area 4.4 Earth Sciences, which is accredited by 2025 with a score of 9.08.

Students from all regions of the country and from other countries are trained.

Educational objectives

In accordance with Art. 9, 2 of the Ordinance on state requirements for acquiring higher education degree - Bachelor, Master and Specialist the training should provide:

1. In-depth scientific theoretical and specialized training;
2. Mastering the basics of research and applied science activities;
3. Conditions for educational mobility of students including international comparability of acquired knowledge and skills;
4. Developing the ability to adapt in terms of social, economic and technological changes.

The main objective of the education in this master's program is to provide extensive and in-depth theoretical and factual knowledge in the field of ecology and environmental protection in accordance with modern developments and requirements for acquiring knowledge about natural objects and phenomena, processes, systems and anthropogenic influence.

The MA program allows for the formation of skills for:

- Self-interpretation of knowledge by connecting it with the application of facts through critical perception, comprehension and expression of theories and principles;
- Knowledge of methods and tools enabling to solve complex tasks;
- Implementation of logical thinking and show innovation and creativity in solving non-standard tasks.

Organization of education

A fundamental prerequisite for achieving the educational objectives, is the structure and content of the curriculum. It applies to professionals who have acquired educational qualification "Bachelor" (with the exception of BA program "Ecology and Environmental Protection"). The curriculum has been developed in 4 semesters and includes required and elective courses.

Required courses are related to the acquisition of general and specialized training, providing professional competencies in the fields of ecology and environmental protection. The eligible subjects are associated with specific areas of applied ecology, physical factors of the environment, energy efficiency, mapping methods in ecology, environmental standards for impact assessment and management of natural resources and ecosystem functions.

The specialized training aims at building an optimal educational environment that encourages professional communication of high scientific level and enabling creative expression, using modern training methods in line with the best educational technology at home and abroad, advanced information support of the educational process, planning and maintenance in accordance with the aims and objectives of the training.

Students graduate after defending a thesis.

The educational documentation is periodically updated in line with the modern trends in ecology and environmental protection.

Important conditions for achieving the objectives of the Master's program are the rich teaching, research and practical experience of teachers providing the education. The availability of lecture and computer rooms, modern licensed, and specialized educational software and a rich library ensure a high level of ducation. Different cognitive methods are used - lecture and discussion, multimedia presentations, e-learning methods and more.

Scope of professional competence

The Master's program allows for the formation of personal and professional competencies:

1. Independence and responsibility - the ability to administrative management; responsibility for decision-making in complex conditions; creativity and initiative in business management;

2. for learning - self-assessment of the qualifications assessed by the acquired knowledge and skills, and expanding and updating the professional qualifications;

3. Communication and social competencies - formulate and sets out clear and understandable ideas, problems and solutions; expresses respect and understanding on issues using methods based on quantitative and qualitative descriptions and evaluations; shows wide personal worldview and shows understanding and solidarity with others;

4. Professional - collects, classifies, evaluates and interprets data from the field in order to solve specific problems; applies acquired knowledge and skills in new or unfamiliar conditions; shows ability to analyze in a broad or interdisciplinary context; forms and expresses their own opinion on issues of social and ethical issues.

Opportunities for realization

Graduates will find their realization as environmentalists, experts, specialists, consultants, advisors, auditors, analysts, researchers in ecology and environmental protection, co-managers of European projects and programs, researchers, teachers, assistants in scientific research institutes and universities at home and abroad; in state and municipal government and administration - Ministry of Environment and Water and its subsidiaries, the Executive Agency for the Environment, Ministry of Health, Ministry of Agriculture and Forestry, the administrations of National Parks, Agricultural Academy, municipalities; in the NGO sector; in design organizations, as well as in all other departments and institutes related to environmental issues.

The quality of the obtained qualification corresponds to the public expectations and to the objectives of the Master's program.

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The Professional Standards of the Master's program "Ecology and Environmental Protection" is the basic document that defines the elaboration of the curriculum and the educational courses.

CURRICULUM

MASTER'S DEGREE PROGRAMME

ECOLOGY AND ENVIRONMENTAL PROTECTION

First year

First semester	ECTS credits	**Second semester**	ECTS credits
Fundamentals of ecology	6	Meteorology	6
Soil Science, Soil Pollution and Impacts on the Ecosystems	6	Environmental protection management Water Pollution and Impact on Ecosystems	6 6
Air Pollution and Impact on Ecosystems	6	Treatment of solid waste	6
Conservation of Biological Diversity	6	Purification of fluids	6
Environmental monitoring	6		

Second year

Third semester	ECTS credits	**Fourth semester**	ECTS credits
Compulsory Courses		***Compulsory Courses***	
Ecosystem Services	6	Environmental Management Systems (EMS)	4
Protection of Streams, Rivers and Lakes	6	Nature Conservation	4
Soil Conservation and Soil Fertility Protection	6	Urbanization and Environment	4
Waste Management	6	Elective course 1 (from Group II)	3
	3		
Elective course 1 (from Group I)	3	Preparation and defense of a graduation thesis	15
Elective course 2 (from Group I)			
Elective courses (students choose two courses from Group I)		***Elective courses*** (students choose one course from Group II)	
I Group		**II Group**	
Environmentally Friendly Management of Natural Resources		Landscape and Environmental Friendly Management of the Territory	
Environmental Norms and Standards		Management of Protected Areas	
Problems of Sustainable Development		Public Relations in the Environmental Protection	
Ecological risk		Regional Programs for Environmental Protection	
Application of GIS in Environmental Protection			
Mathematical Models in Ecology and Environmental Protection			
	Total 60		Total 60

TOTAL FOR FOURTH SEMESTERS: 120 CREDITS

COURSE DESCRIPTION

FUNDAMENTALS OF ECOLOGY

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: I
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. prof. Lidia Sakelarieva, PhD
E-mail: sakelarieva.lidia@swu.bg

Annotation: The course "Fundamentals of Ecology" focuses on the core approaches and concepts in ecology as an interdisciplinary science that links together the biological, physical and social sciences and is closely related to the environmental protection. The aim of the course is to present the basic characteristics of biological macro-systems – populations, communities, ecosystems, and to form skills in research, analysis and evaluation of these systems.

Course content: The course content has been structured in two sections:
Section I. Ecology as a science. Environmental factors. Subject, tasks, and methods of research in ecology. Basic environmental factors – abiotic, biotic, and anthropogenic. The concept of limiting factors. Light, temperature, air, water and soil as environmental factors. Ecological groups of organisms depending on their adaptations to different light, temperature and moisture regimes. Water and soil as mediums for life. Ecological classification of aquatic and soil organisms.
Section II. Population ecology, synecology, ecosystem ecology. Population characteristics – structure, density, birth rate, death rate, age distribution, dispersion, growth form. The biotic community concept. Community structure – species, morphological (vertical and horizontal) and functional. Types of interactions between two species. Ecological niche. Concept of the ecosystem. Productivity, energy flow and biogeochemical cycles. Ecosystem development. Primary and secondary succession. Concept of the climax. Biosphere.

Technology of education and grading: The course is included in the e-learning platform Blackboard. The lectures are designed in the form of PowerPoint presentations. The practical exercises are conducted in a laboratory, or as field trips. The final grade is formed on the basis of continuous control and final examination. The continuous control takes place during the semester and includes assignments and tests (in the e-learning platform Blackboard). The students' preparation and work during the exercises are also assessed. The relative weight of the continuous control from the final grade is 50%. The examination procedure includes a final test in e-learning platform Blackboard The final grade is formed if the student' grade on the final examination is at least 3.00. Credits are awarded only if the final grade is equal to, or higher than 3.00.

SOIL SCIENCE, SOIL POLLUTION AND IMPACTS ON THE ECOSYSTEMS

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: I
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Boyko Kolev, PhD
E-mail: bkolev@swu.bg

Annotation: Soil Science, Soil Pollution and Impacts on the Ecosystems is one of the compulsory subjects for students in Master's program in 'Ecology and Environmental Protection'. The course provides students with basic knowledge about the origin and development of soils and the problems that arise from their pollution and degradation. Special attention is given to approaches to overcome these problems and ways to restore soil fertility. Raised issues relating to soil science as a science and discipline, studying the soil as a natural body, and an important part of the ecosystem in which to spread and develop living terrestrial organisms, as well as the basic means of production in agriculture.

Course content: Formation and development of the soils in Bulgaria; Properties and classification of soils in Bulgaria; Classification and major soil groups, classes and soil types in Bulgaria; The soils in Bulgaria, evaluation and storage.

Technology of education and grading: Lectures are developed with Power point and presented with video-projector. During the laboratory exercises, students learn the principles of GIS application software to compile thematic soil maps and their use in the cadaster, land division, monitoring and management of land resources. A periodical control is held in the semester by assigning course papers and/or by solving tests. The examination process includes a written exam on topics (at least two) of the content of the course syllabus distributed in advance. The final grade constitutes 40% of the periodical control grade and 60% of the grade from the semester examination.

AIR POLLUTION AND IMPACT ON ECOSYSTEMS

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: I
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. prof. Emilia Varadinova, PhD
E-mail: emilia.varadinova@swu.bg

Annotation:

The course "Air pollution and the impact on ecosystems" studies the sources of air pollution and the main factors influencing the processes of pollution and pollutant transport. Climate change, the adverse effects of air pollution on abiotic and biotic components of the environment are analyzed, health and economic aspects of air pollution are considered.

Course content:

The course examines the composition, structure of the atmosphere, the main sources of air pollution, the impact of pollution on ecosystems, noise, electromagnetic and radioactive air pollution, basic laws and regulations regarding clean air, priorities in our national policy, health and economic aspects of pollution.

Technology of education and grading:

The course is conducted on the basis of advance planning of each lecture, which includes: topic, connections between the previous and the new lecture, connections with other disciplinary areas, introduction, plan, presentation, discussion and summary. The lecture material is developed on Power point and presented with a video projector.

The practical classes are held in subgroups in a laboratory, where students analyze established in national legislation definitions related to the assessment of ambient air quality and the bioindicative capacites of living organisms. Practical examples of the negative effects of air pollution on ecosystems and humans are discussed. Some of the exercises are related to a visit to an atmospheric air monitoring point to read the data from an automatic measuring station.

During the semester there is a periodic control of the acquired knowledge through preparation and presentation of presentations, and at the end of the semester - a course work dedicated to local, regional or global issues in the field of air pollution and cleanliness.

The examination procedure includes a written examination on two topics from the content of the course from a previously distributed syllabus. The final grade is formed with a relative weight of 40% practical classes and 60% of the exam

CONSERVATION OF BIOLOGICAL DIVERSITY

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: I
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Eng. Konstantin Tyufekchiev, PhD
E-mail: konstantinat@swu.bg

Annotation:

The course Conservation of Biological Diversity provides the necessary knowledge of contemporary issues in protecting the rapidly diminishing biological diversity (biodiversity - for short), which is the result of evolutionary processes and random genetic changes over a period of several billion years back in the past. It is an integrated approach to the protection and management of biodiversity that uses appropriate principles and knowledge: from basic biological fields such as genetics, biology and ecology, management of areas of natural resources, such as hunting, fishing and wildlife, and the social sciences such as anthropology, sociology, philosophy and economics.

Course content:

The course is divided into three parts. The first addresses the goals, objectives, importance and methods in the conservation of biodiversity, processes and trends in the development of global biodiversity. The second part covers the problems of conservation of biological diversity at the species, population and system level. The third part deals with practical applications, and the consideration of human activities on the protection of biodiversity at the global, but also at the regional level. This knowledge will enable students to use an integrated approach in the defense of biodiversity and to achieve the necessary powers to take appropriate advanced solutions in the management of protected natural territories and objects, as well as many practical skills such as the development and maintenance of new travel programs, routes in cognitive and ecological tourism.

Technology of education and grading:

The lectures are elaborated as Power point presentations and involving the use of visualizations - graphics, print and copy materials. Some of the classes are held in the school hall where discuss theoretical facts, processes and phenomena, then place practical tasks that students perform individually. The rest of the classes are conducted within the selected protected areas.

The final grade is formed on the basis of continuous control and written exam. The continuous control takes place during the semester and includes a test, an assignment, and the students' preparation and work during the exercises. The share of the continuous control from the final grade is 40%. The examination procedure includes a test or exam on a topic of the three

sections from the discipline content. The share of the written exam from the final grade is 60%. The final grade is formed on condition that the student' grade on the written exam is at least 3.00.

ENVIRONMENTAL MONITORING

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: I
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. prof. Emilia Varadinova, PhD
E-mail: emilia.varadinova@swu.bg

Annotation:

As a result of the high rates of industrialization and the increased negative human impact, the environment is being polluted at such a rate and scale that the problem of its protection is becoming of paramount importance on a global scale. International thematic initiatives prioritize the need for periodic, large-scale and objective assessment of the state of the components of the environment, which should be carried out through a unified methodological monitoring system.
The subject of the course "Ecological Monitoring" is the study of the information system for monitoring, registration and control of the state, quality and changes of the main components of the natural environment in unaffected conditions and as a result of anthropogenic pressure.

Course content:

Course covers two groups of theoretical questions:

- basic concepts, structure and capacity of the system for environmental monitoring, environmental problems in the regions for economic development in Bulgaria, a European scheme for trading greenhouse gas emissions and national allocation of quotas;
- monitoring of environmental components, noise and waste - the conditions for deployment of stations, instrumental analysis, limits eligible concentrations and results of the monitoring programs.

Technology training and assessment:

In the process of training students are provided lectures and practical exercises. In the lectures students get acquainted with the theoretical basis of the discipline, divided into two groups. The lecture material is visualized at the power point, illustrating with thematic graphic material specific environmental situations, maximum permissible concentrations of various pollutants of environmental components, commenting on best available techniques and environmentally friendly practices. The practical exercises are conducted in a laboratory, as the students under the guidance of the teacher mark on a map of Bulgaria the points of the ecological monitoring on the separate components of the environment, the most polluted zones are outlined and analyzed.

The examination procedure includes a written examination on two topics from the content of the course curriculum. The final grade is formed by 40% of the exercises and 60% of the exam.

METEOROLOGY

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: ongoing assessment and examination **Exam**: written
Semester: **II**
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Krasimir Stoyanov, Ph.D.
e-mail: krasi_sto@swu.bg

Annotation: The course "Meteorology" is studied by students in Master's program "Ecology and Environmental Protection" and aims to make them familiar with the structure, composition and processes developing in the atmosphere and laws of formation, geographical distribution and historical changes of the climate. Mainly in the course is studied the climate system consisting of secondary components – atmosphere, ocean, cryosphere, land surface and biomass.

Course content: The students acquired knowledge about the weather, the factors that determine and their characterization. They assimilate basic skills to prepare weather forecasts, too. An attention is given to hazardous phenomena related with weather – hails, tornadoes, dry winds, heavy rainfall, storms and more. During the course students are introduced to the genesis of climate and climatic division of the Earth. The object of the examination is also the nature and specificity of the microclimate and especially of urban environment. Special attention is paid to climate change in historical view as well as its contemporary variations. The causes of global warming and environmental consequences for the Earth and Bulgaria are analyzed. An emphasis is also put on the problem of air pollution caused by human activity. A great part of the course is devoted to practical exercises that enable students to acquire skills in meteorological instruments and equipment, processing climatic data and also to produce climatic characteristics of an area, etc.

Technology of education and grading: The tuition is realised by lectures, practical exercises and individual work. Modern interactive methods of teaching are used. During the semester an ongoing control by assigning a paper or presentation is carried out. It includes solving a test, too. Criterion for assessing is the degree of implementation of tasks (paper, test) taking into account: the level of competence, analysis, and understanding. Examination procedure includes a test or written exam after a predefined syllabus. The relative weight of the exam of total test score is 60%.

ENVIRONMENTAL PROTECTION MANAGEMENT

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: II
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. prof. Emilia Varadinova, PhD
E-mail: emilia.varadinova@swu.bg

Annotation:

The purpose of the course "Management of environmental protection" is to acquaint students with the approaches, methods and principles in the implementation of management activities aimed at environmental protection. In the process of study, students acquire skills for analysis and assessment of various environmental situations related to pressures and impacts on air, water, soil,

biodiversity, as well as the adverse effects of noise, radioactive and electromagnetic loading, and waste generation. The education provides students with the necessary knowledge and competencies to participate in expert teams in the development of strategies, programs and management plans, as well as in the preparation of environmental expertise and assessments.

Course content:

Basic principles in environmental protection - current strategies and programs. Characteristic features of control systems. Goals and functions of the management system. Matrix model of the functions and types of management activities. State policy and environmental management bodies. Basic statements and regulatory requirements. Information about the state of the environment - types, ways and means of obtaining. Model of management process technology. Management of activities in the use and protection of the earth's bowels, soil, atmospheric air, water and biological diversity, prevention and reduction of industrial pollution and others.

Technology of education and grading:

The training in the discipline "Management of environmental protection" is carried out by teaching 45 hours of lectures and conducting 15 hours of practical exercises. The lecture material covers the main issues on the content of the studied discipline, as well as various means of illustration - multimedia, demonstration software, visual materials (boards, posters, etc.), etc. Students form their works on individual topics as a course project, which are evaluated and only with a positive grade (at least an average of 3.00) are admitted to the exam. The training in the discipline ends with a written exam.

The final grade is formed on the basis of the defense results of the course assignments and the semester exam (in a ratio of 50/50%), according to the developed and accepted in the department system for control and assessment of students' knowledge.

WATER POLLUTION AND IMPACT ON ECOSYSTEMS

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: II
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. prof. Emilia Varadinova, PhD
E-mail: emily.varadinova@gmail.com

Annotation:

The course "Water pollution and impacts on ecosystems" studies the sources of water pollution, anthropogenic pressure, the factors influencing the processes of pollution, decomposition and transportation of pollutants, the impact of water pollution on ecosystems.

The practical classes provide an opportunity for students to work independently on the sampling of biological elements for water quality, measurement of basic physico-chemical parameters of the aquatic environment, determination of nutrients. Additionally, visits are organized to institutions responsible for water supply, treatment of domestic and industrial waste, which are authorized to control the purity and pollution of surface and groundwater bodies.

Course content:

The training course contains topics dedicated to the sources of pollution, types of water pollutants, water typology, status assessment of standing and lotic aquatic ecosystems, water treatment, health risk analysis and economic aspects of water use.

Technology training and assessment

The course is conducted on the basis of advance planning of each lecture, that includes: topic, connections between the previous and the new lecture, connections with other disciplinary areas, introduction, plan, presentation, discussion and summary. The lecture material is developed on Power point and is presented with a video projector.

The practical classes are held in subgroups in a laboratory, where students are introduced to practical examples related to water pollution, assessment of the ecological status of water bodies, the bioindicative abilities of water organisms. The negative impacts of water pollution on ecosystems and people are discussed and analyzed. Some of the exercises are related to field research and visits to institutions authorized to perform water analysis, as well as drinking water / wastewater treatment plants.

During the semester a periodic control of the acquired knowledge through preparation of presentations is carried out, and at the end of the semester - a course work dedicated to local, regional or global issues in the field of air pollution and cleanliness. Students are admitted to the exam when they have fulfilled the requirements of the Regulations for the educational activity of SWU, for mastering the content of the discipline, set in their classroom and extracurricular employment, and the general assessment of the current control is not lower than Average 3.

The evaluation procedure includes a written examination on two topics from the content of the course curriculum. The final grade is formed with a relative weight of 40% practical classes and 60% of the exam.

TREATMENT OF SOLID WASTE

ECTS credits: 8 **Hours per week:** 3l+2pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: VI
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer:
Chief assistant prof. Veselina Dalgacheva, PhD, dalgacheva@swu.bg

Annotation:

The purpose of the course is to acquaint students with the basic concepts of the accepted European and Bulgarian hierarchy in waste management and the resulting priorities. The discipline aims to prepare staff to carry out waste integrated management, the control activities, to participate in the development of plans, programs, expertise and EIA reports in the field of waste management. Emphasis in the training is placed on sustainable development, involving the application of environmentally friendly technologies, the specific benefits of their implementation, with elements of waste minimization, recovery, reuse and final disposal.

Course content:

The course provides an opportunity to obtain the necessary knowledge of regulatory requirements and procedures for collection, transportation, analysis of the quantities and properties of waste. Particular attention shall be paid to the obligations of waste generators to prevent or reduce the quantities and hazardous properties of the waste generated by:

- development and application of modern environmentally friendly technologies that save the use of primary natural resources;
- development of appropriate methods for final disposal of hazardous substances contained in waste destined for recovery.

Technology training and assessment

The lecture course is conducted on the basis of advance planning of each lecture, which includes: topic, connections between the previous and the new lecture, connections with other disciplinary areas, introduction, plan, presentation, discussion and summary. The lecture material is developed on Power point and is presented with a video projector.

The practical classes are held in subgroups in a laboratory, where students are introduced to practical examples related to waste treatment.

During the semester a periodic control of the acquired knowledge through preparation presentations is carried out, and at the end of the semester - a course work dedicated to local, regional or global issues in the field of air pollution and cleanliness. Students are admitted to the exam when they have fulfilled the requirements of the Regulations for the educational activity of SWU, for mastering the content of the discipline, set in their classroom and extracurricular employment, and the general assessment of the current control is not lower than Average 3.

The evaluation procedure includes a written examination on two topics from the content of the course curriculum The final grade is formed with a relative weight of 40% practical classes and 60% of the exam.

PURIFICATION OF FLUIDS

ECTS credits: 6 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examinatio **Examination type:** written
Semester: II
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Dimitrina Kerina, PhD, e mail: d_kerina@swu.bg;
Chief.Assist Prof. Veselina Dalgacheva, PhD, e-mail: dalgacheva@swu.bg

Annotation: The course Purification of fluids is mandatory for students included in the second semester curriculum of Ecology and Environmental Protection, Master's degree. The course has a total workload of 60 hours, including 45 hours of lectures, laboratory exercises 15 hours and 120 extracurricular hours. The course aim is to provide knowledge about the methods for purification of fluids.

Course content: The course content has been structured in three divisions:
I. Fluid Mechanics including kinematics and dynamics of fluids;
II. Methods for treatment of dust and gas fluids-absorption and adsorption, condensation, chemical, mechanical, filtration;
III. Methods for purification of waste water-mechanical, evaporation and crystallization, chemical, biochemical and extraction.

Technology of education and grading: Lectures are presented in the form of multimedia presentations. Practical exercises are carried outin subgroups. Student's extracurricular training is mainly related to work in a library, internet, individual and group consultationson training exercises and presentations for on-going controland on exam.
Students are carried out in accordance with the European system of credit transfer (ECTS).
The final evaluation form at the end of the course on the basis of the written test and monitoring. The share of current control in the overall assessment is 40%. The final grade is based on six-point scale as follows: 6 evaluation is equivalent to level A of ECTS; 5 assessment equivalent to level B of ECTS; a score of 4 equals the level C of ECTS; a score of 3 is equal to the level of D ECTS.

ECOSYSTEM SERVICES

ECTS credits: 4 **Hours per week:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: III
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Lidia Sakelarieva, Phd, Depatrment "Geography, Ecology and Environmental Protection"
E-mail: sakelarieva.lidia@swu.bg

Annotation: Prosperity of human society have always been closely linked with the natural environment, and the presence of natural resources such as minerals, oil, valuable timber and fertile land was crucial for the material wealth of each country. Over the past two decades, the notion of the value of natural resources has changed radically as the state of environment is deteriorating rapidly. Elements of nature such as clean air, abundant clean drinking water, greenery in cities and beautiful landscapes, until recently taken for granted, become more and more valued by people. The main objective of the course is to provide basic knowledge about the ecosystem services - the benefits, direct and indirect, that people derive from ecosystems functioning, and to develop skills for assessment of these services.

Course content: Global environmental problems. Anthropogenic impact on the environment at regional level. Concept and strategy for sustainable development and link with other global strategies. The concept of ecosystem services. Classification of ecosystem services. Guiding principles and methods for assessing ecosystem services. Classification of methods and assessments of ecosystem services. Modern problems of realizing the concept of sustainable development.

Teaching and assessment: The lectures are presented by using PowerPoint. The practical classes are conducted in a laboratory. Some of the classes are held in the field, where some of the methods for assessing ecosystem services are tested. During the semester the students prepare PowerPoint presentation for different types of ecosystem services or methods for assessing ecosystems and their services.
The final grade is formed on the basis of on-going control and written exam. The relative weight of the written examination from the final grade is 50%. Credits are awarded only if the final grade is equal to or higher than the average 3.00.

PROTECTION OF STREAMS, RIVERS, AND LAKES

ECTS credits: 6 **Weekly workload:** 3l+1pe
Form of assessment: on-going control and exam **Examination type:** written
Semester: III
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Michail Michailov, PhD
E-mail: mam@swu.bg

Annotation: The subject "Protection of watercourses and basins is studied (during training leading to a Master program in Ecology") to extend and deepen knowledge of processes in rivers, lakes and other (artificial) water courses or objects. Particular attention is paid to the basic characteristics and factors in the formation of water quality in watercourses and basins required in the discharge of

wastewater to the receiver, their categorization, assessments loading with pollutants samoprechistvatelnata ability of watercourses, organizing The monitoring system of watercourses and ponds and control pollution of the waters, the development of programs for the protection of watercourses and ponds, and others.

Course content: Key features and factors in the formation of water quality in watercourses and ponds. Sources of pollution of watercourses and ponds. Categorization of watercourses and ponds. Indicators and standards for water quality in watercourses and ponds. Requirements for waste water discharge to the receiver. Minimum allowable flow in watercourses. Receiver load with pollutants. Distribution and transformation of pollutants in watercourses and ponds. Samoprechistvatelna capacity of watercourses. Oxygen regime of watercourses and ponds. Monitoring and control of pollution of watercourses and ponds. Regulations. Principles and methods for determining the locations of checkpoints. Prediction of water quality in watercourses and ponds. Managing water quality in watercourses and ponds.

Teaching and assessment: Course "Protection of watercourses and pools is done by teaching 45 hours lectures and conducting practicals 15 hours. The lectures cover the main issues on the content of discipline, and various means of visual - multimedia, educational videos, software demonstration, visual aids (charts and schemes), some of which are developed as coursework for students. Practical exercises are conducted in subgroups and target acquisition of practical skills for recording, analysis and evaluation of activities related to protection of watercourses and ponds.During the practical exercises are carried out monitoring of the acquired knowledge and skills. Students shape their work on individual topics such as exchange rate targets that are evaluated and only a positive assessment (at least an average 3.25) are allowed to test. Course ends with a written exam. Final assessment is based on the results of the protection of tasks and course of semester examination (in 50/50%) as developed and adopted in the Department GEOOS "system for monitoring and evaluation of the students' knowledge.

SOIL CONSERVATION AND SOIL FERTILITY PROTECTION

ECTS credits: 6 **Weekly workload:** 3l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: III
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturers: Associate Professor Dr. Boyko Ivanov Kolev, PhD., Geography, Ecology and Environment Protection Department,
E-mail: bkolev@swu.bg

Annotation: The course soil conservation and soil fertility protection is one of the compulsory courses for students in Master's program in ‘Ecology and environment protection’. Study is to broaden and deepen students' knowledge of soil as a natural body, through the processes and phenomena occurring in pedosphere, atmosphere, hydrosphere and lithosphere. Discussed are issues related to soil science as an academic discipline that deals with soil as the natural body and an essential tool for agricultural production. The course aims to familiarize students with contemporary plays in the field of soil science globally and with some changes in recent years in Bulgarian agriculture. Therefore the task of learning is through scientific knowledge for soil to ensure the rational use and conservation to increase yields of all crops and livestock productivity increase in mandatory compliance with the principles of organic agriculture and sustainable development in the industry.

Course content: Formation and development of soil properties and soil classification; Soil classification and major soil groups, Classes and types of soils in Bulgaria; Basic soil differences soils in Bulgaria - evaluation and storage.

Teaching and assessment: Students make three control tests during the semester. Requirements for the semester are regularly visited classes; perform the tasks required GPA and test average 3.00.

WASTE MANAGEMENT

ECTS credits: 6 **Hours per week:** 3l+1pe+p
Form of assessment: on-going control and examination **Examination type:** written
Semester: III
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Eng. Konstantin Tyufekchiev, PhD
E-mail: konstantinat@swu.bg

Annotation: The discipline Waste Management is taught to students educating on the master program Ecology and Environment Protection and aims at training specialists to run a pedagogical activity and control, to take part in developing plans and programmes in the area of waste management. The stress is put on the stable development that demands environmentally friendly technologies with elements of minimization of wastes, their use, re-use and final making them harmless. The EU Directives, Regulations and Resolutions concerning waste management are discussed during the educational process.

Course content: The discipline gives basic knowledge on: Types of wastes; Nature and condition of wastes in Bulgaria; Management of specific waste flows; Criteria for selection of grounds for regional integrated management; Methodology for making the depots fulfil the regulations' requirements; Techniques and technologies for use and making wastes harmless.

Teaching and assessment: Lectures are provided for the students in the course of the education. In the lectures they become familiar with the theoretical basis of the discipline. The lectures are held following the classical manner and are visualized with EU documents and documents approved in Bulgaria, good practices in the world concerning the lecture content are discussed. The students develop a paper on a topic from the syllabus that they defend. The grade is considered a current control. Extracurricular classes of students are predominantly consisting of work in libraries and Internet, individual and group consultations. The final grade constitutes 50% of the periodical control grade and 50% of the grade from the semestrial examination according to developed and approved in GEEP Chair system of control and grading students' competence.

ENVIRONMENTALLY FRIENDLY MANAGEMENT OF NATURAL RESOURCES

ECTS credits: 3 **Weekly workload:** 2l+0pe
Form of assessment: examination **Examination type:** written
Semester: III
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Emilia Varadinova, PhD,
E-mail: emilia.varadinova@swu.bg

Annotation:

The course "Environmentally friendly management of natural resources" is studied in order to acquire knowledge about: mineral and energy balance and water balance of resources and environmentally friendly opportunities for their rational use; global climate change and its impact on the environment; limit possibilities of ecological load of the natural-anthropogenic systems; sustainable management of the bioanthroposphere; commitments made by the Republic of Bulgaria; opportunities and technological solutions for replacement of natural resources with secondary waste materials.

Course content:

The course covers several groups of thematic orientations: The first group includes the general legislative framework and the normative base of the ecological management of the natural resources, the methodical and methodological bases, the principles of environmental management. The second group acquaints students with the problems arising from anthropogenic activity and opportunities for environmentally friendly management of environmental components. The third group focuses on the analysis of sustainable development and the relationship with environmental education.

Technology training and assessment:

In the process of training students get acquainted with the theoretical basis of the discipline. The lectures are conducted in the classical way, illustrated with graphic material, photos, videos. During the training course there is an ongoing control for assessment of knowledge - development and defense of an essay that corresponds to the content of the exercises. Evaluation criterion is the degree of implementation of the tasks (development of a thematic project) taking into account: the levels of competence and analytical skills. The evaluation is performed according to the six-point system. Only students who have fulfilled the requirements for mastering the content of the course and the Regulations for the educational activity of SWU "Neofit Rilski" with a total grade of the current control not lower than Average 3 are admitted to the exam.
The final grade is formed by 50% of the grade of the periodic control and 50% of the grade of the semester exam according to a system for control and assessment of students' knowledge developed and accepted in the Department: “Geography, Ecology and Environmental Protection”.

ENVIRONMENTAL NORMS AND STANDARTS

ECTS credits: 3 **Weekly workload:** 2l+0pe
Form of assessment: examination` **Examination type:** written
Semester: III
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Emilia Varadinova, PhD,
E-mail: emilia.varadinova@swu.bg

Annotation:

The regulated ecological requirements and the introduction of norms with a view to limiting the pollution of the components of the environment is one of the most dynamically developing directions in the Bulgarian legislation. Its harmonization with European priorities and requirements marked the beginning of a new legal framework through the development of specialized laws and regulations defining the priorities, strategies and responsibilities of citizens and institutions.

The course "Environmental norms and standards" introduces students to the objectives of environmental policy based on the requirements of European directives and principles, as a scientific basis for the preparation of environmental norms and standards, balance of the responsibility between central and local authorities and public participation in environmental management.

Course content:

The training includes the study of national environmental legislation on the components of the environment (air, water, soil, biodiversity), noise, radioactivity and waste management. The sanctions for exceeding the maximum permissible concentrations of pollutants are studied, as well as the applied incentives for limiting emissions and introduction of environmentally friendly technologies.

Technology training and assessment

The course is conducted on the basis of advance planning of each lecture, that includes: topic, connections between the previous and the new lecture, connections with other disciplinary areas, introduction, plan, presentation, discussion and summary. The lectures are visualized through a power point, illustrated with key documents of the European and national legislation, the examples of good world practices in environmental protection are analyzed and various ecological situations are assessed.

Each student develops a course project on one of the questions set in the syllabus. The evaluation procedure includes a written examination on two topics from the content of the course curriculum. The final grade is formed with a relative weight of 40% practical classes and 60% of the exam.

PROBLEMS OF SUSTAINABLE DEVELOPMENT

ECTS credits: 3 **Weekly workload:** 2l+0pe
Form of assessment: examination **Examination type:** written
Semester: III
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Michail Michailov, PhD
E-mail: mam@swu.bg

Annotation: The aim of the course "Problems of sustainable development” is to give the students in “ Ecology and Environmental Protection” – “Master program” basic knowledge of the legal framework and approaches for realizing the concept of sustainable development. Students acquire skills to analyze and evaluate various issues relating to sustainable development posed by poor forecasting and strategic planning, due to deficiencies in the organization and implementation of "best practices" to achieve sustainable development, etc. Particular attention is paid to the implementation of effective approaches resursopolzvane, greater involvement of renewable energies in energy systems and others.

Course content: Concepts and strategies for sustainable development. Global environmental change and the concept of sustainable development. Energy use and sustainable development resursopolzvane. Structure and peculiarities of the problems in sustainable development. Problems associated with poor strategic planning and forecasting. Problems related to improper implementation of programs and plans for sustainable development. The Education for Sustainable Development (ESD). Research for Sustainable Development. Innovations for sustainable

development. Social and demographic problems in sustainable development of regions. Management of sustainable development. Institutional and regulatory framework. Indicators for sustainable development.

Teaching and assessment: Course "Problems of sustainable development" is done by teaching 30 hours lectures. The lectures cover the main issues on the content of the discipline, and various means of visual - multimedia, video training, demo software, visual aids (charts and schemes), some of which are developed as coursework for students.
Learning course "Problems of sustainable development" is linked to the outdoor work 60 hours, which includes self-training of student and teacher consultation in connection with investigation of additional literary sources (libraries, Internet and others.), analysis and evaluation of results, forming the technical exchange tasks, essays, etc.., presentation and protection of completed works. Exercise ongoing control of acquired knowledge and skills. Students shape the course work as tasks that are evaluated and only a positive evaluation (at least an average 3.25) are allowed to test. The course ends with a written exam. The final assessment is based on the results of the protection of tasks and course of semester examination (in 50/50%) as developed and adopted in the Department GEOOS "system for monitoring and evaluation of knowledge to students.

ECOLOGICAL RISK

ECTS credits: 3 **Hours per week:** 2l+0pe
Form of knowledge evaluation: Examination **Examination type:** written
Semester: III
Methodological guidance:
Chair: "Geography, Ecology and Environment Protection"
Faculty: Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Dr. Krasimir Stoyanov, PhD
E-mail: krasi_sto@swu.bg

Annotation: The course "Ecological risk" is an elective course included in the curriculum of MA "Ecology and Environmental Protection". The course aims to familiarize students with the reasons for the occurrence and the character of natural disasters, dissemination and negative effects on the environment and economic activity of man. This course gives an initial idea of the problems associated with managing the risk of natural and technogenic disasters, as well as some possible approaches to introducing automation to support decisions concerning preventive action and action to eliminate the negative impacts of disasters.

Course content: The course gives basic competence on: The various types of hazardous processes caused by the anthropogenous factor; Environment pollution due to natural disasters; Effect of harmful emissions on humans and ecosystems; Regulatory basis – laws, regulations, instructions (Environment Protection Law, Forestry Law etc.) concerning the environment protection.

Teaching and assessment: Lectures are provided for the students in the course of the education. During the lectures they become familiar with the theoretical basis of the course. The lectures are held following the classical manner and are visualized by means of EU documents and documents approved in Bulgaria, the world good practices concerning the lecture content are discussed. The students develop a paper on a topic from the syllabus that they defend. The grade is considered a current control. The extracurricular classes are predominantly consisting of work in libraries and Internet, individual and group consultations. The final grade constitutes 50% of the periodical control grade and 50% of the grade from the semestrial examination.

GIS APPLICATION IN ENVIRONMENTAL PROTECTION

ECTScredits: 3 **Weekly norm:** 2l+0pe
Form of control learning: examination **Вид на изпита:** written
Semester: III
Under methodical guidance of:
Department of Geography and Ecology and environmental protection
Faculty of Mathematics and Natural Science
Lecturer: Assoc prof. Penka Kastreva, PhD
E-mail: penkakastreva@swu.bg

Annotation:

The subject "Application of geographic information systems in environmental protection" is designed for the students whose bachelor degree is not in "Ecology and environmental protection" and they have not studied the basic course in GIS. The course aims to introduce the students to the theoretical initial knowledge in Cartography and GIS, as well to the application and the increasing role of GIS in the area of the planning, management and environmental protection. All knowledge is directly oriented to the systems of mapping, management, analysis and supports the decision making in the management of geographical sites and areas that have local or regional distribution. The purpose of the exercises for the students is to use GIS systems for plotting cartographic content, learning interpolation algorithms when making cartographic modeling, generalization and other, cartographic research, analysis and procedures.

Contents of the subject:

Section I. Fundamentals of Computer Cartography: The lecture course includes topics from the basic course in Cartography, which deals with the mathematical basis of the map and related concepts of scale, coordinate systems, map projections and database structure in GIS.

Section II. Theoretical background: In the beginning of the section are included topics that are dedicated on the main GIS conception – components, type and model data, basic data operation and geographic analysis. Further the course includes fundamental topics for development and implementation of GIS related environment. Various applications of remote sensing for mapping, monitoring and environmental research in GIS medium are considered (ecosystem modeling, the dynamics of the biosphere, wildlife, biodiversity, etc.).

Section III. Seminar lectures with student participation: The students are placed in a real situation presenting their vision for the creation of a future project for GIS management of pre-defined territory and its implementation. The end result is a presentation of the research topic of each student and discussion.

Teaching technology and assessment:

The lectures and exercises are conducted solely on the equipment basis of the Department „Geography Ecology and Environmental Protection". To illustrate the lecture material are used: computer with video – projector, study videos, specialized software (ArcGIS), additional materials (tables, diagrams and maps), some of which have been developed as students' course and diploma works.

A computer multimedia laboratory with licensed ArcGIS software is used for the practical exercises (within the seminar lectures). Students who study with an individual plan independently develop the same tasks with free GIS software (QGIS). For the normal conduct of the exercises the students are divided into groups and each student has a separate computer.

During the semester periodically the students are assigned individual tasks or tests. The tasks are fully related to digital work environment with specialized software for mapping and using of maps.

The students are admitted to the exam with a minimal note of 3, which is formed as the average of all notes received during the semester. The final note is 40% of the periodic evaluation and 60% of the semester examination assessment according to the department's developed and adopted system for control of the students' knowledge and skills.

MATHEMATICAL MODELS IN ECOLOGY AND ENVIRONMENTAL PROTECTION

ECTS credits: 3 **Hours per week:** 2l+0pe
Form of assessment: examination **Examination type:** written
Semester: III
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Mihail Kolev, PhD, Department Mathematics
E-mail: mkkolev@swu.bg

Annotation: The educational process in this course includes teaching of ecology in order to apply the methods of mathematical modeling for investigation of ecological problems, ecosystems and problems of the environment, in particular the air and water pollution, climatic changes etc. Basic mathematical models in ecology will be considered and analyzed with special attention to the application of the population theory.

Course content: Mathematical modeling. Systematic approach to the modeling of ecosystems. Models for assessment and management of exhaustible natural resources and renewable natural resourses. Climate model of the secretion of carbon dioxide. Modeling communities (plant associations). Modeling of forest ecosystems. Modeling of aquatic ecosystems. Modeling economic growth with exhaustible natural resources. Modeling of populations in protected areas. Control theory of dynamical systems. Solutions for open and closed loops. Stability and sustainability of ecosystems. Stability of equilibrium of open type fixed cycle.

Teaching and assessment: During the lectures the topics are developed in detail. Through the course students are introduced to the main theoretical material included in the discipline. Available software packages are used for performing programming and simulations.
Evaluation procedures applied in the process of the course are: monitoring and written exam.

ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS)

ECTS credits: 4 **Weekly workload:** 2l+1pe
Form of knowledge evaluation: examination **Type of exam: written**
Semester: IV
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Michail Michailov, PhD
E-mail: mam@swu.bg

Annotation: Course "Environmental management systems" taught (during training leading to a Master program in "Ecology") to extend and deepen knowledge about the management of the environment. Students acquire skills of analysis and evaluation of various management activities on the use and protection of environmental components including and as regards the clarification of the possible impacts on them.

Learning course management systems environment "provides students with the knowledge and opportunities to participate in teams in developing strategies, programs, systems and management plans for environmental components.

Course content: Strategies and policies on the environment. Definition, nature and requirements management systems operations environment. Aims and objectives of management of the environment (EMS). Structure, units and scope of EMS. Documentation of the EMS. Control over the EMS. Specifics in the management of the use and conservation of the various components of the environment. Requirements for training of personnel for the effective functioning of the EMS.

Teaching and assessment: Course management systems environment "is implemented by teaching 30 hours lectures and conducting practicals 15 hours. The lectures cover the main issues on the content of the discipline, and various means of visual - multimedia, educational videos, software demonstration, visual aids (charts and schemes), some of which are developed as coursework for students.
Practical exercises are conducted in subgroups and target acquisition of practical skills to manage the conservation activities of the various components of okornata environment. During the practical exercises are carried out monitoring of the acquired knowledge and skills. Students shape their work on individual topics such as exchange rate targets that are evaluated and only a positive assessment (at least an average 3.25) are allowed to exam. Course ends with a written exam. Final assessment is based on the results of the protection of tasks and course of semester examination (in 50/50%) as developed and adopted in the Department GEOOS "system for monitoring and evaluation of the students' knowledge.

NATURE CONSERVATION

ECTS credits: 4 **Hours per week:** 2l+1pe
Form of assessment: on-going control and examination **Examination type:** written
Semester: IV
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Eng. Konstantin Tyufekchiev, PhD
E-mail: konstantinat@swu.bg

Annotation:

Discipline “Nature Conservation” is learned by students in the specialty “Ecology and Environmental Protection (EEP)" in order to obtain basic knowledge for the conservation of natural areas and objects by placing them under a certain mode of protection (conservation). The course is relatively new scientific discipline that separates mainly focus on theoretical and practical problems of conservation as a current method in modern nature conservation.

Course content: Deals with issues relating to the classification of protected natural areas and sites (ZPTO) for conservation regimes adopted in world practice, the device of ZPT, which are subject to ecological tourism. Advanced considered ZPTO in Bulgaria, their conservation status, spatial distribution and landscape character.

Teaching and assessment:

Course under Course includes theoretical instruction based on lectures on key topics from the curriculum content, combined with discussions of cold self-training on important topics of the course and practical exercises to specify the students' knowledge on a practical level. During the

exercises to work with real objects, models and survey data, using interactive teaching methods. Some of the themes developed outdoor - in the natural environment on land protected natural areas, guarding the fields of plant and animal species and other taxa of regional, national, European and global. Absorption of the educational content is supported by the use of visual aids (tables, presentations, printed copies, software) and hardware (computer, multimedia, etc.).

During the semester out routine monitoring by assigning homework, coursework and/or papers and/or testing. The final evaluation is based on periodic evaluation of control (50%) and 50% of the estimated semester examination under developed and adopted in the Department GEOOS "system for monitoring and evaluation of the students' knowledge.

Each student develops paper for one or two protected areas, evaluating their importance in terms of biodiversity and protecting it against other students. As part of its evaluation and the other students, and assessment into account in the final evaluation of the student during the session. Takes place during the semester and a control test. In estimates derived from the continuous control of very good students are exempted from written examination. The exam is written

URBANIZATION AND ENVIRONMENT

ECTS credits: 4 **Hours per week:** 2l+1pe
Form of knowledge evaluation: Examination **Examination type:** written
Semester: IV
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer:: Prof. Maria Shishmanova, Ph.D
E-mail: valkova_chich@swu.bg, valkova_chich@abv.bg

Annotation: The lecture course is a compulsory discipline for master degree in Ecology. The basic objective of the course is to provide competence on the essence and main principles for development of the urbanization and its influence on the environment, as well as on the feedback. Becoming familiar with the environment specifics and the urbanization phenomenon, the students form an overall notion for the feasible processes and phenomena within the co-relation between the urbanization and the environment, the way the village environment is planned and built and the feasible ways to oppose in order to protect the relative stability at interaction between the anthropogenous and natural environment. All these results in acquiring skills with which being a specialist the student will be capable of participating in the organization, projecting, planning, management and control of every territory in its various levels (area, region, municipality, mayor-hall and every single village). The scientific training provided is to turn the students into an absolutely beneficial in the chain protection, restoration, management and control of the co-relation urbanization-environment.

Course content: The first module covers the phenomenon “town-environment”. The town as an ecosystem, Conception for town-planning structure, Town-planning model – town-planning practice, Urbanization – environment. Conflicts: preservation and reviving, reconstruction. The second module covers the component territories of the town with their specifics. The third module discusses the specific territories in the town structure – for recreation, cultural values. The fourth module characterizes the internal and external technical infrastructure.

Teaching and assessment: Grading the results shown in the course of education complies with the provisions of Regulation No. 21 of the Ministry of Education and Science from 30.09.2004 for applying the system for accumulation and transfer of credits.

A periodical control is held in the semester by assigning course papers (K) and/ or papers (R) and/ or by solving tests (T). The final grade constitutes 50% of the periodical control grade and 50% of the grade from the semestrial examination according to developed and approved in GEEP Chair system of control and grading students' competence. For visualization of the lecture material taught is used a computer, overhead projector, software for demonstrations, pictorials (boards and schemes), parts of which are developed as real regional strategies, plans, programmes and projects. For the practical exercises is used the material-technological fund of GEEP Chair, and that of the Territorial and Village Structure Department of Blagoevgrad Municipality and Blagoevgrad Region by taking advantage of the freedom the archive gives for different analysis.

LANDSCAPE STUDY AND ENVIRONMENTAL FRIENDLY MANAGEMENT OF TERRITORY

ECTS credits: 3 **Hours per week:** 2l+0pe
Form of knowledge evaluation: Examination **Examination type:** written
Semester: IV
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturer:: Assoc. Prof.. Ivan Drenovski, Ph.D
E-mail: idri@swu.bg

Annotation:

Course "Landscape study and environmental friendly management of territory" is taught as an optional discipline of students in the Master's Program of Ecology and Environmental Protection "of the subject geography in order to obtain knowledge of the principles and methods of implementation of the regional approach to environmental policy and management. Topic is particularly relevant in relation to the implementation of the strategic concept of sustainable development and achievement in the management practice of its main slogan: "Think globally, act locally". One of the main tools for realization in practice of local and regional level, the principles of sustainable development and environmentally sound management of the territory landscape planning. Students get acquainted with experience of leading a number of European countries - the legal framework, systems and levels of management, coordination of activities, features and tools for balancing the requirements for environmental friendliness, economic growth and social prosperity. In the absence of regulation of landscape planning in Bulgaria is considered the methodology for mapping of functional zoning of territory and justification of actions required to maintain the status of the environment. Carry out a review of the various sectoral policies related to the environmentally sound management of the territory and the tools for their realization in our country.

Course content:

Objectives, tasks, principles and methods of environmentally sound management of territory and landscape planning. General legal framework and regulations, basic tools of environmentally sound management of the territory - regional development, spatial planning, environmental protection, environmental requirements in sectoral policies. Operational Programme "Regional Development" 2007-2013 and "environment". Influence of the main industries on territorial development and the environment - energy, transport, agriculture and industry. Environmentally sound management of the planning regions for 2007-2013.

Teaching and assessment:

Major form of verification and assessment of students' knowledge of written exam. Knowledge and skills students are evaluated on six-grade system. Current controls are applied to assess the activities that assess the degree of mastery of the material, knowledge, skills and

competence during the training during the semester. It is to check the knowledge of students and their ability to absorb new knowledge. Be implemented based on the work of students during the exercises, award and implementation of course assignments and tests. Students are evaluated by monitoring at least 3.00 shall be admitted to the written examination. Students who are not admitted to an examination of current control are assigned additional tasks. The written exam consists of developing a theme and a brief statement in the form of a statement made during the semester course work. The final mark is formed as an average of continuous assessment and evaluation of the written examination, provided that at least among the latter is 3.00. It is calculated using the formula: AA = 0,5. IT + 0,5. PI.

MANAGEMENT OF PROTECTED AREAS

ECTS credits: 3 **Hours per week:** 2l+0pe
Form of assessment: examination **Examination type:** written
Semester: IV
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturer: Assoc. Prof. Eng. Konstantin Tyufekchiev, PhD
E-mail: konstantinat@swu.bg

Annotation:

Course "Managemen of Protected Areas " is learned by students in the specialty “EEP " Master degree of Ecology to broaden and deepen the knowledge of management of protected areas. By students acquire skills for making management decisions on various activities in guarding and use of protected areas.
The course "Managemen of Protected Areas” include issues related to methodologies for developing strategies, programs and management plans for various types of protected areas.

Course content:

Within 30 hours are lectures addressed various environmental regimes adopted in world practice and Bulgaria, the structure of different protected area (PA) and goals and objectives of the systems of management. On the basis of specificity in different states PA structure, units and scope of such systems is being revealed and studied. The documentation used in the management of PA and the opportunities to introduce modern IT-technology are examined. The questions about control over management systems as well as human resources requirements are included in the course.

Teaching and assessment:

Course includes theoretical instruction based on lectures on key topics from the content of the curriculum through the use of interactive methods, combined with self-study discussion of important topics in the cold of course. Some of the topics taught at information centers and bases of PA in the presence of active managers of different rank in priority using the interactive mode. Absorption of the educational content is supported by the use of visual aids (tables, presentations, printed copies, software) and hardware (computer, multimedia, etc.).
During the semester is done through routine monitoring of domestic award course assignments (K), and / or essays (R) and by testing (T). The final evaluation is based on periodic evaluation of control (50%) and 50% of the estimated semester examination under developed and adopted in the Department GEOOS "system for monitoring and evaluation of the students' knowledge.
Each student develops paper for managing one or two protected territories and defend them against other students. As part of its evaluation and the other students, and assessment into account in the final evaluation of the student during the session. Takes place during the semester and a control test.

In estimates derived from the continuous control of very good students are exempt from 50% of the material for the written exam. Exam is a written.

PUBLIC PELATIONS IN THE ENVIRONMENTAL PROTECTION

ECTS credits: 3 **Weekly workload:** 2l+0pe
Form of knowledge evaluation: examination **Type of exam: written**
Semester: IV
Methodological guidance:
Department: "Geography, Ecology and Environmental Protection"
Faculty of Mathematics and Natural Sciences
Lecturers: Assoc. Prof. Michail Michailov, PhD
E-mail: mam@swu.bg

Annotation:

The aim of the course in Public Relations environment is to give students in Ecology and Environmental Protection - ACS Master basic knowledge of the legal framework and approaches for effective public participation in conservation environment.
Students acquire skills of analysis and evaluation of legal formulations, requirements and procedures for public participation in activities for environmental protection, the circumstances in public discussions of strategies, programs and assessments of environmental impact, etc.
Particular attention is paid to the role of NGOs, research institutes and business justifications for asserting different interests in protecting the environment.

Course content:

Role of NGOs, research institutes and business organizations in the field of environmental protection. Nature and characteristics of public participation in the activities of environmental protection. Legal Productions, requirements and procedures for public participation in activities for environmental protection. Peculiarities in public discussions of strategies, programs and assessments of environmental impact. Rights and obligations for public hearings on initiatives and investment intentions for action. Forms of public participation in the activities of environmental protection - advice, opinions, discussions, etc.. Development of environmental education as a precondition for more active public activities in environmental protection.

Teaching and assessment:

Course in Public Relations in the environment is done by teaching 30 hours lectures (on the main issues on the content of the discipline) and 60 hours outdoor work, which includes the student's self-training and consulting in connection with teacher further study of literary sources (libraries, Internet and others.) analysis and evaluation of results, technical design of coursework tasks, essays, etc.., presentation and protection of completed works.
Exercise ongoing control of acquired knowledge and skills. Students prepare coursework tasks are evaluated and only a positive evaluation (at least an average 3.25) are allowed to test. Course ends with a written exam. Final assessment is based on the results of the protection of tasks and course of semester examination (in 50/50%) as developed and adopted in the Department GEOOS "system for monitoring and evaluation of the students' knowledge.

REGIONAL PROGRAMMES FOR ENVIRONMENTAL PROTECTION

ECTS credits: 3 **Hours per week:** 2l+0pe
Form of assessment: examination **Examination type:** written
Semester: III
Methodological guidance:
Department: “Geography, Ecology and Environmental Protection”
Faculty of Mathematics and Natural Sciences
Lecturers:
Assoc. Prof. Emilia Varadinova, PhD,
E-mail: emilia.varadinova@swu.bg

Annotation:

The solution of the problems for protection of the environmental factors and the sustainable development of a given region is based on developed programs with envisaged measures in the action plans. Programs and plans at the regional level provide integrated environmental management in accordance with the principles and objectives of the Environmental Protection Act, the Regional Development Act and their national strategies. Programs and plans at the regional level ensure integrated environmental management, in accordance with the principles and objectives of the thematic national legislation. The mentioned issues are the subject of the subject "Regional programs for environmental protection".

Course content:

The study material is structured in two groups: Basic information related to the current Strategies and programs of the EU and Bulgaria. Methodology for developing regional programs for environmental protection, incl. programs for protection and reduce air pollution, water pollution, biodiversity conservation and waste management.

Technology training and assessment:

In the process of training students get acquainted with the theoretical basis of the discipline. The lectures are conducted in the classical way, in addition, documents, photos, videos and programs at the municipal and regional level are illustrated. The preparation of students is mainly related to work in the library and on the Internet, individual and group consultations. Development and defense of a course project is envisaged. The evaluation criterion is the degree of implementation of the tasks, taking into account: the levels of competence, analytical skills and the ability to propose environmentally friendly solutions. Only students who have fulfilled the requirements for mastering the content of the course and the Regulations for the educational activity of SWU "Neofit Rilski" with a total grade of the current control not lower than Average 3 are admitted to the exam.