

Osh State University "Current environmental issues in Kyrgyzstan"

Name of Study Programme 520 200 Biology	
Name of Module: Current environmental issues in Kyrgyzstan	
Module number	Block No. M2, Group B, Elective Part (<i>offered for the 2026-2027 academic year</i>)
Person responsible	Abdykaarov Abdimannap, Ph.D., Associate Professor
Duration of the module	1 spring semester
Semester	I semester
Frequency of the module	2nd academic semester
ECTS-Credits (CP)	3 credits
Semester hours per week, number of weeks	2 hours per week (14 weeks)
Workload	90 hours (1 credit 30 hours) Contact hours (Classroom hours): 45 hours Independent work: 45 hours
Type of module	Block No. 2, Group B Variable part
Required prerequisites for the module	The aim of studying the discipline is to develop a holistic ecological worldview in students and to instill universal principles of modern environmental management, which will help them practically address environmental protection issues. This goal is achieved through the following objectives: - To provide students with knowledge of the fundamentals of general ecology, revealing the causes of global and regional environmental problems. - To familiarize students with the sources and factors of anthropogenic impact on the environment and their consequences. - To introduce students to the environmental problems of Kyrgyzstan and their consequences. - To teach students how to justify the standards of permissible environmental impact. - To familiarize students with various aspects of environmental protection under conditions of increasing anthropogenic pressure. - To introduce students to the system of state governance in the field of environmental protection. Course Objectives
Recommended prior knowledge for the module	Since this discipline is taught in the first year, the fundamental natural science concepts learned in the school curriculum (in biology, geography, social studies) are a sufficient basis for its mastery.
Teaching language Язык преподавания	Kyrgyz, Russian, later also in English
Competencies gained / Learning outcome	Learning Outcomes As a result of studying the discipline, the master's student will achieve the following learning outcomes (LO), corresponding to the expected results of mastering the educational program (ERMP) and the competencies specified for the discipline: Competencies PO 5. Understands global and regional environmental problems and the place of humanity in them; can conduct socio-ecological-economic

	analysis, predict and identify crisis situations; Natural science and ecology can influence the solution of global problems of humanity to achieve Professional Competence (PC 1): Knows the natural conditions of the region, its main resources, the region's ecosystems, the essence of modern environmental problems and the interaction of society and nature (PK-27). Possesses an ecological worldview and the skills to contribute to solving global challenges of humanity in order to achieve sustainable development (PC-28) (A).
Content of the module	Course Program 1. INTRODUCTION TO THE DISCIPLINE Subject and objectives of modern ecology. The environmental problem as one of the global issues of our time. The current ecological state of the Republic in the context of increasing anthropogenic impacts on the environment. Regional and local environmental problems of the Kyrgyz Republic and their effects on the environment. Causes of environmental problems and possible ways to address them. Introduction to Environmental Science 2. CURRENT STATE OF THE CLIMATE CHANGE PROBLEM IN KYRGYZSTAN Modern climatic conditions of the Kyrgyz Republic. Assessment and forecast of climate variability in the mountainous regions of Kyrgyzstan (Tian Shan). Main approaches and solutions to climate problems. Glacier retreat and related issues. Natural disasters. Increasing pollution of glacier surfaces. Mining industries in the high mountain zones of Kyrgyzstan. The Kumtor gold deposit and its consequences. Pollution of the air basins in Kyrgyz cities. Chemical composition of the atmosphere in Bishkek, Osh, and other cities of Kyrgyzstan. Exhaust gases and their impact on public health. Possible ways to solve existing problems. 3. RECREATIONAL RESOURCES OF KYRGYZSTAN (Problems and Solutions) The mountainous nature of the territory of the Kyrgyz Republic. The richness of natural healing factors in Kyrgyzstan. Sanatorium-resort treatments and recreation. Important climatic features of the Issyk-Kul basin. Weather-climatic and landscape characteristics of the nut-fruit forest regions (Arslan-Bob, Kara-Alma). The role of mountain-climatic health resorts and mass recreation zones in southern Kyrgyzstan. 4. CURRENT STATE OF WATER RESOURCES IN KYRGYZSTAN The importance of snow cover. Mountain ranges (Chatkal, Alay, Fergana) and the annual water reserves of the snow cover. Solar radiation. Renewable water resources — a strategic and vital natural resource of the Kyrgyz Republic. Rivers and lakes of the republic. Sources of water resource runoff in Kyrgyzstan. The ongoing process of glacier retreat. Reservoirs in the republic. Toktogul Reservoir. Ways to protect the water resources of the Kyrgyz Republic. 5. LAND RESOURCES OF KYRGYZSTAN AND LAND USE "Soil Map of the Kyrgyz SSR" (A.M. Mamytov et al.). Soil erosion. Causes of accelerated erosion processes. The problem of pasture degradation. Pasture lands of the Republic. Causes of pasture

	deterioration. Grazing of livestock and sheep. Protection of pastures from degradation. 6. FOREST RESOURCES OF KYRGYZSTAN Ecosystems of Kyrgyzstan. The current state of Kyrgyzstan's forests. Artificial ecosystems, formation of urban ecosystems. Specially Protected Natural Areas (SPNAs): Nature Reserves, National Parks, Wildlife Sanctuaries, Natural Monuments. Nature Reserves are one of the most reliable and effective forms of preserving natural ecosystems. The SPNA system adopted by the International Union for Conservation of Nature (IUCN). Reasons for the need to expand the territories of SPNAs. 7. STRATEGY FOR SOLID MUNICIPAL WASTE MANAGEMENT IN THE KYRGYZ REPUBLIC Analysis of the current situation in the solid municipal waste management system. Classification of solid municipal waste (SMW). Household waste storage sites (landfills). Goals and objectives of the SMW management strategy. Practices for solving SMW problems in other countries (Netherlands). Turning waste into income. RADIOACTIVE WASTE AND POLLUTION Radiation situation in the Kyrgyz Republic. Tailings and mining dumps accumulated from heavy metal production and coal mining. Monitoring of radiation background. Main mines in Kyrgyzstan. Potential health impacts. Ways to address the problems. CURRENT STATE OF FLORA AND FAUNA OF KYRGYZSTAN The fauna and flora of Kyrgyzstan. The Kyrgyz Republic is a unique place in Central Asia for the concentration of wild animal and plant species. The Red Book of the Kyrgyz Republic. The number of species and endemics of flora and fauna in Kyrgyzstan. Medicinal plants of Kyrgyzstan. The threat of biodiversity loss. FOOD SAFETY Food safety. Genetically modified organisms (GMOs). Food additives: "E-numbers." Essential supplements: iodine, probiotics, antioxidants. Food contamination: nitrates, foodborne infections. About food utensils. Harm from medicinal drugs.
Applicability of the module	Corresponding educational programs: 520200 Biology. 550100 Natural Science Education. Offered for all areas of training.
Requirements for the award of credit points (Study and exam requirements)	Course Policy 1. Attendance and Participation • Students are required to attend all lectures and practical (seminar) sessions. • Proper behavior and discipline must be maintained during classes, as established by the instructor. • Absences without a valid reason may result in a lower final grade. • Careful note-taking, theoretical preparation for each lesson, active participation, and timely completion of missed assignments are separately evaluated. • Late arrivals are discouraged; repeated lateness may lead to penalties at the instructor's discretion. 2. Academic Integrity and Plagiarism

	• Plagiarism and academic dishonesty include copying someone else's work, cheating, and presenting another's material as one's own. • Any cases of plagiarism or dishonesty on exams or assignments will result in grade penalties or other measures according to university regulations. 3. Deadlines and Late Submission Penalties • All homework, projects, and other assignments must be submitted by the specified deadlines. • Late submissions will incur point deductions. • Arriving late to class or leaving without a valid reason affects participation evaluation. 4. Retake and Appeal Policy • Retake of exams and assessments follows the procedure established by the instructor. • Grade appeals must be submitted in writing within the timeframe set by the instructor. 5. Use of Gadgets in Class • The use of phones, laptops, and other devices during lectures is allowed only with instructor approval or for learning purposes. 6. Formatting and Citation Rules • All written work must comply with university formatting requirements. • Proper citation and a complete list of references are mandatory. 7. Consultations and Office Hours • Consultation schedules and office hours are set for individual consultations and guidance on independent student work (ISR). • More details: Consultation Schedule 8. Academic Integrity Declaration • All students must sign a declaration confirming compliance with the university's academic integrity policy. • Regulation: "Organization of the Educational Process at OshSU" A-2024-0001, 03.01.2024 Course Grading System (100 points) Module 1 – 25 points • Lecture: 4 points • Practical (seminar) session: 6 points • Independent student work (ISR): 6 points • Practical independent work (PIR): 4 points • Control work (CW): 5 points Module 2 – 25 points • Lecture: 4 points • Practical (seminar) session: 6 points • Independent student work (ISR): 6 points • Practical independent work (PIR): 4 points • Control work (CW): 5 points Final Exam – 50 points
Learning and teaching types	Forms of Instruction • Lectures • Seminars • Independent student work (ISR, PIR) Assessment Methods • Ongoing assessment: tests, essays, reports • Final exam

	Teaching Methods • Lectures using multimedia technologies. • Practical sessions in the form of case studies, situation analysis, and project development. • Independent student work (ISR, PIR): preparation of essays, presentations, reports, and the final project. Forms of Assessment • Ongoing assessment: evaluation of practical sessions, tests, essays. • Intermediate assessment: defense of presentations, case studies, and reports. • Final assessment: development and defense of an environmental program project.
Literature (latest editions) and other instruction material	Electronic Textbooks Main References: 1. Kulnazarov B.K. General Ecology – Moscow, 2000. – 352 pages. 2. Mansurova T.B. Ecology of Kyrgyzstan: A textbook for university students, Public Fund "Phoenix Yug" – Bishkek, 2000. – 190 pages. 3. Mursaliev A.M. General Ecology. Textbook for Natural Science and Humanities faculties of higher education institutions of the Kyrgyz Republic / A.M. Mursaliev, T.Z. Niyazov, A.B. Shamsiev – Bishkek: "Turar", 2010. – 486 pages. Legal and Regulatory Acts Textbooks 1. [11:41, 27.08.2025] ChatGPT: 4. National Report on the State of the Environment of the Kyrgyz Republic for 2006-2011. – Bishkek, 2012. – 128 pages. 2. 5. Environmental Review of the Kyrgyz Republic. State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic. – Bishkek, 2009. – 96 pages. 3. 6. National Strategy for Sustainable Development of the Kyrgyz Republic (for the period 2013-2017). – 2013. – 12 pages. 4. 7. Collection of Regulatory Legal Acts of the Kyrgyz Republic in the Field of Environmental Protection. Volume 2 "Bylaws and Instructional-Methodological Documentation." Part 1 / D.E. Bekkulova, Zh.A. Kadoeva, A.Sh. Dzhalilobaev, V.V. Grebnev, A.K. Nurbekov – Bishkek, 2016. – 536 pages. 5. 8. Collection of Regulatory Legal Acts of the Kyrgyz Republic in the Field of Environmental Protection. Volume 2 "Bylaws and Instructional-Methodological Documentation." Part 1 / D.E. Bekkulova, Zh.A. Kadoeva, A.Sh. Dzhalilobaev, V.V. Grebnev, A.K. Nurbekov – Bishkek, 2016. – 536 pages. 6. 9. Collection of Regulatory Legal Acts of the Kyrgyz Republic in the Field of Environmental Protection. Volume 2 "Bylaws and Instructional-Methodological Documentation." Part 2 / D.E. Bekkulova, Zh.A. Kadoeva, A.Sh. Dzhalilobaev, V.V. Grebnev, A.K. Nurbekov – Bishkek, 2016. – 542 pages. 7. [11:41, 27.08.2025] ChatGPT: 10. Neustroev A.V. et al. Learning from Nature. A Guide for Schools on Biodiversity Conservation of Issyk-Kul. – Bishkek, 2014. – 100 pages. 8. 11. Kyrgyzstan: Environment and Natural Resources for Sustainable Development. – Bishkek, 2006. – 92 pages.