ONLINE SHORT-TERM PROGRAMS

Despite the COVID-19 coronavirus pandemic and related restrictions, in 2021 International Competence Centre for Mining-Engineering Education under the auspices of UNESCO organizes a number of **international short-term programs** on the base of **Saint Petersburg Mining University**.

Mining University is one of the top and most dynamically developing technical universities and R&D centers in Russia. Not only we provide a superb education for mining engineers, civil engineers, economists, mechanic engineers, oil and gas engineers, geologists, we are also proud of our extracurricular activities, infrastructure, and location.

All short-term courses will take place in a distanced format using **Zoom**. The platform allows participants to attend the training from anywhere in the world.

Summer schools include lectures and practical classes, master classes and trainings.

The key principle of online courses will be **interactivity**. Teachers will be able to stream real-time videos and presentations online, listeners will be able to ask questions live or send text messages.

To participate, you will just need a computer (laptop) with a camera and a microphone, access to the Internet. All participants will be provided with the necessary technical support and links to connect.

At the end of the training program, our participants will receive **certificates of completion**.

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SHORT-TERM EDUCATIONAL PROGRAM
TODAY'S ENVIRONMENTAL CHALLENGES

Purpose of the program:

- The purpose of the program is to acquire theoretical knowledge and practical skills to assess the state of the environment and ensure environmental safety in the modern world.

Main objectives of the program:

- Obtaining additional knowledge in the field of assessment of the ecological state of landscapes on the basis of application of big data sets (Big Data), integral indicators of environmental quality and interpretation of the results of field and laboratory research;
- gaining additional knowledge in the field of engineering and technical and remediation methods to reduce the anthropogenic load on the environment and ensure the stable functioning of ecosystems.

Category of students:

- Students and postgraduate students studying in areas of training related to the earth sciences, geography, geology, geoecology, environmental protection.

Planned learning outcomes

As a result of mastering the program the graduate should form the following competencies:

- the ability to perform "diagnostics" - assessment of the ecological condition of landscapes based on the results of statistical data collection from open sources of satellite imagery (RS), scientific databases and production reports;
- the ability to perform "treatment" - the design of engineering and environmental solutions to achieve a balance of resource use and environmental safety;
- the ability to develop a solid waste management strategy, solve water disposal and water treatment problems, and design reclamation of disturbed land;
- the ability to plan and carry out observations of environmental quality indicators and solve problems on the design of specially protected natural areas.

In order to achieve the **additional professional competencies**, students in the process of mastering the Short-term program must:

Gain knowledge of the issues:

- studying the processes of pollution of ecosystems, peculiarities of formation and current development of ecological risk zones;
- identifying problems in the processes of transformation of natural landscapes related to industrial operations;
- understanding of the existing ways of disturbing land resources and their ecological consequences;

- to study scientifically grounded ideas about the impact of the processes of growth and development of megacities and promagglomerations on the components of the environment.

Develop skills:

- calculation of ecological and economic damage from pollution and soil disturbance in man-made landscapes;
- analysis of sources of environmental pollution in disturbed areas and principles of their restoration;
- economic assessment of the main directions of restoration of disturbed and polluted lands and requirements for their implementation;
- planning the main directions of restoration of disturbed lands.

Acquire skills:

- theoretical justification of ecological foundations of the biological stage of reclamation of disturbed and contaminated lands;
- application of organizational, legal and normative legal principles and legislation in the sphere of ensuring ecological safety of development of technogenic territories;
- application of big data (Big Data), integral indicators of environmental quality and interpretation of the results of field and laboratory research;
- development of measures to ensure environmental safety in the production of municipal waste management in the territory of promagglomerations.

Sections of the professional module, topics	**Content of the training material**	**Hours**
Introduction. Environmental challenges of our time	- Tasks of ecology as a science - Scale and intensity of anthropogenic impact on landscapes - Development of measures providing stable functioning of ecosystems	2
Module 1: Collecting and Interpreting Environmental Data	- Application of the laboratory research complex for environmental modeling - The use of "Big Data" in environmental assessment - Integral assessment of landscape disturbance and pollution	10
Module 2. Preventing Pollution in Landscapes	- Achieving a balance of resource consumption and environmental safety - Ecological aspects of the provision of the city with electric energy - Energy Efficiency - Ensuring environmental safety of transport infrastructure	12
Module 3. Reducing the environmental hazards of municipal waste and soil remediation	- Wastewater treatment - Waste management - Drafting landscape reclamation and remediation projects based on data on the level of disturbance and pollution	10
Module 4. Specially Protected Natural Areas	- Biological monitoring for environmental quality assessment - Forming clusters of protected areas Maintaining the functioning of protected lands	10

Sections of the professional module, topics	Content of the training material	Hours
Total hours		44