



RECYCLING OF PRODUCTION AND CONSUMPTION WASTE

MASTER'S PROGRAMME DEGREE



PROGRAM ADVANTAGES

- ✓ The ability to professionally solve problems in the field of waste management in any region of the world;
- ✓ Obtaining universal knowledge, both in the field of industrial and municipal waste management, and in the field of waste collection, treatment and storage technologies;
- ✓ Implementation of project learning opportunities, acquisition of teamwork skills;
- ✓ Improving communication skills and proficiency in a professional language, including foreign;
- ✓ The opportunity to receive first-hand information from leading experts in the field of waste management;
- ✓ Opportunities to study world experience in the field of waste management, learn from foreign experts;
- ✓ The ability to study the program in a modular mode using distance technologies, including in English
- ✓ The opportunity to undergo practical training at real enterprises, in government services and government bodies.



STUDYING PROCCESS

120 credit.

Including lectures, practical and laboratory classes, several types of practices, and is designed for 2 years of study. The training courses taught as part of the educational program include the study of a complex of basic and professional disciplines, including optional disciplines



COMPUTER TECHNOLOGIES AND STATISTICAL METHODS IN ECOLOGY AND NATURE MANAGEMENT

- Study of the theoretical foundations and features of the use of computer technologies for searching and processing data arrays and statistical methods in scientific and practical socio-economic and environmental research.
- In particular, the development of methods for assessing the representativeness of the material, the volume of samples when conducting quantitative studies, statistical methods for comparing the data obtained and determining patterns for large and small samples.
- Developing the skill of using modern computer tools for processing statistical data and solving theoretical and practical problems, including in the field of production and consumption waste management, management of MSW landfills and assessment of their impact on the environment.



BASICS OF MICROBIOLOGY AND BIOTECHNOLOGY

- Formation of knowledge, abilities and skills in the field of biochemistry of microorganisms.
- Study of metabolic pathways and cycles. Study of the ability to control the rates of individual reactions of each metabolic pathway and the general rates of metabolic pathways in the cell of microorganisms.
- Study of a highly developed system of regulation of microbial metabolism using regulatory mechanisms.
- As well as the formation of students' systemic ideas about the theoretical and methodological foundations of biotechnology, ideas about biotechnological methods and tools used to protect and rehabilitate the environment, about the role of biotechnology as a basis for effective management of natural resources and the formation of a sustainable economy.



REGIONAL AND MUNICIPAL WASTE MANAGEMENT SYSTEMS

- Formation of the theoretical foundations of waste management as a source of valuable secondary material and energy resources. Principles of drawing up territorial waste management schemes, responsibilities and functions of regional operators, analysis of the effectiveness of the introduction of environmental tax as a regulatory instrument of extended producer responsibility (EPR).
- During the training, innovative teaching technologies are used in the format of a business game and the development and protection of an industrial project, which allows you to form practical skills in the field of effective management of production and consumption waste.



TECHNOLOGIES FOR RECYCLING AND UTILIZATION OF MUNICIPAL SOLID WASTE

- Formation of knowledge, skills and abilities in the use of technologies and equipment for processing, recycling and safe storage of municipal solid waste.
- Sources of waste generation and their composition.
- The main types of waste, their brief description, principles of classification and subsequent processing.
- Mechanical processing of municipal solid waste.
- Heat treatment of MSW.
- Waste gasification.
- Waste pyrolysis.
- Fire method of waste treatment. Incineration of solid combustible waste.
- Classification of combustion methods.
- Features of the formation of urban wastewater sediments.
- Precipitation characteristics (moisture, density, fluidity and contamination).
- Sludge treatment processes: compaction, stabilization, conditioning, dehydration, disinfection and decontamination.



PECULIARITIES OF RADIOACTIVE WASTE MANAGEMENT

- Formation of students' ideas about the features of radioactive waste management.
- Classification and features of radioactive waste, skills in the use of the main regulatory documents in the management of radioactive waste.
- Modern requirements for radioactive waste management.
- Technical and organizational aspects of radioactive waste management.



ENVIRONMENTAL HAZARD OF WASTE

- Formation of professional and general professional competencies in the field of ensuring environmental safety when handling solid waste.
- The principles of the stability of the biosphere and natural-man-made ecosystems, the role of the self-healing potential of soils (PSP assessment) and natural waters (PSV assessment), the scattering power of atmospheric air (PSA assessment), the most hazardous substances in the components of municipal and industrial waste, the mechanisms of their transformation and migration features in the environment.



GREEN ECONOMY AND SUSTAINABLE ENTERPRISE' DEVELOPMENT

- Study of the theoretical foundations and applied aspects of the circular economy (circular economy) and the prospects for sustainable development of industrial enterprises.
- Including enterprises working in the field of processing and disposal of municipal solid waste (MSW).
- Studying the modern experience of developed European countries (Germany, Sweden, Japan).
- Energy recovery and production of energy resources from MSW.
- The organization of closed gas-air cycles during heat treatment of waste.
- The formation of the ability to make managerial decisions in the "low-carbon" economy.



MODERN BIOTECHNOLOGY FOR RECLAMATION OF MSW LANDFILLS

- Planning the full life cycle of MSW landfills and organization of work to ensure the environmental safety of MSW landfills at all stages of the life cycle, features of the organization of permanent storage of MSW and technologies for preparation for disposal;
- Stages and technologies of reclamation; post-operational maintenance of landfills.
- Using the energy potential of landfill gas.
- Features of the formation of the filtrate and its collection and processing.
- Fundamentals of organizational and management activities at MSW landfills.
- In total, the curriculum provides for the study of 22 disciplines, including 6 blocks of optional disciplines, two types of practices and research work.



STUDENTS FEEDBACK



TIBETSKAYA ANASTASIA VLADIMIROVNA

Faculty of Ecology, direction 05.04.06 Ecology and nature management, graduate of 2019, currently - consultant of the department of regulation and regulation in the field of waste management of the Department of State Supervision and Regulation in the Field of Waste Management and Biodiversity of the Federal Service on supervision in the field of environmental management (ROSPRIRODNADZOR), work experience 3 years



In my third year, I chose the Department of Environmental Monitoring and Forecasting for specialization. After completing my bachelor's degree in the direction 03/18/02 "Resource-saving processes..." and successfully defending my diploma on the disposal of sewage sludge, I chose the magistracy in the direction 05.04.06, specialization "Recycling of production and consumption waste". The skills that I received in the magistracy allowed me to find a job in the Federal Service for Supervision of Natural Resources (ROSPRIRODNADZOR). The knowledge gained allows me to effectively carry out my job duties, I have formed a comprehensive view of the waste management industry, not only from the point of view of environmental protection, but also taking into account legal and economic aspects.



BASAMYKINA ALENA NIKOLAEVNA

Faculty of Ecology, direction 05.04.06 Ecology and environmental management, graduate of 2019, currently - a postgraduate student of the Department of Environmental Monitoring and Forecasting, head of the technical department of Areal Engineering LLC, 2 years of work experience.



I graduated from the Faculty of Ecology in the direction of 05.04.06 Ecology and environmental management, specialization in Recycling of production and consumption waste in 2019. Currently, I am a universal specialist in the field of wastewater treatment, waste treatment, gas-air emissions treatment, as well as in the field of heat pump systems. I develop technological solutions for the processing of solid and liquid waste (including toxic), carry out commissioning of technological lines for wastewater treatment and waste processing. Thanks to the language skills I have acquired during my studies at the Faculty of Ecology, I provide professional technical translation from English and German in the field of environmental engineering.





STUDENTS FEEDBACK



GRIGORETS ELIZAVETA ANDREEVNA

Faculty of Ecology, direction 05.04.06 Ecology and Nature Management, graduate of the magistracy in 2017, currently a postgraduate student of the Department of Environmental Monitoring and Forecasting, Research Engineer of the Scientific Center for Operational Monitoring of the Earth, JSC Russian Space Systems (ROSCOSMOS) , work experience 5 years



I graduated from the Faculty of Ecology and my final qualification work was devoted to the substantiation of the location of the MSW processing complex in the Chekhov District of the Moscow Region using GIS technologies. The skills gained during my studies and graduation work help me today to successfully participate in experimental design and research work in the direction of remote sensing of the Earth, in the development of ground space infrastructure and use the results of space imagery of the orbital constellation of spacecraft for their intended purpose in accordance with traceable trends.



. GILKAMAIGUA GUANOLUIZA CATHERINE ALEJANDRA (ECUADOR)

Faculty of Ecology, direction 05.04.06 Ecology and Nature Management, graduate of 2019, currently works as Head of the Department of Safety, Health, Environment and Quality of ALUMINEX S.A. in Ecuador, work experience 2 years



My name is Katherine. The topic of my thesis was devoted to the introduction of resource-saving technologies in the production of aluminum at the ALUMINEX S.A. plant. in the Republic of Ecuador. Now I work at ALUMINEX S.A. This company is engaged in the purchase and sale of materials suitable for recycling aluminum slag for the production of pure aluminum. My position is Head of Safety, Health, Environment and Quality. I love my job, I love what I do. Now all the knowledge gained is bearing fruit. Thank you RUDN! Thank you Russia!





STUDENTS FEEDBACK



VADIVASOV DMITRY MIKHAILOVICH

Faculty of Ecology, direction 05.04.06 Ecology and environmental management, graduate of the bachelor's degree in 2019, currently a second-year master of the specialization Recycling of production and consumption waste, researcher at the Department of Standardization of Regulatory Practices of the Association "Non-profit Partnership" Coordination and Information center of the CIS member states for the convergence of regulatory practices "NP CIC CIS, 2 years of experience



In my bachelor's degree, the topic of my final qualifying work was related to the assessment of the environmental and economic efficiency of joint disposal of fecal sludge, municipal sewage sludge and animal waste in methane digestion plants. Now, while studying for a master's degree, I try to combine the topics of my research at work with the topic of the future FQP and I am developing methodological approaches for the integral assessment of sustainable development and the life cycle of enterprises. The knowledge that I received in the magistracy helps me a lot at work, especially the ability to receive and analyze scientific information. Also in the training process, I had to participate in various educational and scientific projects, which allowed me to improve such important skills as communication and effective interaction when working in a team. ”





HEAD OF THE PROGRAMME

KHARLAMOVA MARIANNA DMITRIEVNA



PhD in Environmental Science (Chemistry), Associate Professor, Head of the Department of Environmental Monitoring and Forecasting, member of the Scientific Council on global environmental problems of the Russian Academy of Sciences, member of the Scientific and Technical Council of the Federal Service for Natural Resources Supervision (ROSPRIRODNADZOR).

Kharlamova M.D. is the author and head of two basic educational programs (OOP) of the magistracy in the direction 05.04.06 Ecology and environmental management, specialization “Recycling of production and consumption waste” (in Russian) and “Integrated Solid Waste Management” (in English), author of more than 10 textbooks and teaching aids, including those with the ULV stamp, more than 50 scientific articles in the field of waste management.

Kharlamova M.D. is the author of MOOC distance courses and implements the principles of Blended Learning in practice. The course “Practical Tools of Solid Waste Management & Environmental Damage Reducing” prepared by her has been hosted and has been successfully operating since 2020 on the educational platform I-versity, Springer Nature.

Kharlamova M.D. is an authoritative specialist and expert in the field of environmental protection, effective management of solid waste production and consumption, the organization of resource-saving and low-waste industries, environmental diagnostics and sustainable development of natural and technogenic ecosystems. She has repeatedly acted as an expert-analyst in the field of environmental protection and sustainable development of RIA Novosti, the newspaper “Argumenty i Fakty”, TV channels RBC, Izvestia, OTR and other well-known Russian newspapers and TV channels. In January 2020, at the request of the deputy of the State Duma of the Russian Federation of the Federal Assembly A.I. Fokin, she prepared a resolution on the draft amendments to Federal Law No. 89-FZ “On Production and Consumption Waste” with regard to improving the mechanism of extended producer responsibility (EPR).