Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA (RUDN University)

Institute of Environmental Engineering

INTERNSHIP SYLLABUS

Pre-graduate internship
internship title

educational
internship type

Recommended by the Didactic Council for the Education Field of:

05.04.06 "Ecology and Nature Management"

The student's internship is implemented within the professional education programme of higher education:

«Integrated Solid Waste Management» (Network program with L.N. Gumilyov Eurasian National University)

Moscow,
2022

1. INTERNSHIP GOAL(s)

The Internship aims at expansion of professional knowledge acquired by masters in the study process, the formation of practical skills and abilities to conduct independent research work, practical participation in the research work of scientific teams, as well as the collection, analysis and generalization of scientific material, the development of original scientific ideas for the of a master's thesis preparation Pre-graduate internship is carried out to perform the final qualifying work and it is mandatory.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The internship is designed for students to acquire following competences (competences in part):

Table 2.1. . List of competences that students acquire during the internship

Code and descriptor of generic competence	Code and competence level indicator
GC-1. Able to carry out a problem situations critical analysis based on a systematic approach, to develop an action strategy.	**GC-1.1** can analyze the problem situation as a system, identifying its components and the links between them
	GC-1.2 owns argumentation and develops a meaningful strategy for solving a problem situation based on a systematic and interdisciplinary approach
	GC-1.3 knows the basics strategies and identifies possible risks, suggesting ways to eliminate them
GC-2. Able to manage a project at all stages of its life cycle.	**GC-2.1** can formulate a project task based on the problem posed and a way to solve it
	GC-2.2 capable to develop the concept of the project, formulate the goal, objectives, justify the relevance, expected results and scope of their application
	GC-2.3 can develop a project implementation plan taking into account possible risks, plans the necessary resources
GC-3. Able to organize and manage the team work, developing a team strategy to achieve the goal.	**GC -3.1** owns the techniques and methods of teamwork, organizes the selection of team members to achieve the goal;
	GC -3.2 capable to organize and adjust the work of the team, including on the basis of collegial decisions
	GC-3.3 can delegate authority to team members and distribute assignments, give feedback on the results, take responsibility for the overall result
GC-4. Able to apply modern communication technologies, including foreign language(s) for academic and professional interaction	**GC -4.1** can establish contacts and organize communication in accordance with the needs of joint activities, using modern communication technologies
	GC-4.2 knows the basics of business documentation and uses professional vocabulary in foreign and Russian languages

	GC-4.3 capable to organize a results discussion and present the results of research and project activities at various public events in Russian or a foreign language, choosing the most appropriate format.
GC-5. Able to analyze and take into account the diversity of cultures in the intercultural interaction process.	**GC -5.1.** knows the main categories of philosophy, the laws of historical development, the intercultural communication basics
	GC-5.2 is able to communicate in the world cultural diversity and demonstrate mutual understanding between students - representatives of different cultures in compliance with ethical and intercultural standards
	GC -5.3. owns the practical skills of philosophical and historical facts analyzing, evaluating cultural phenomena; ways of analyzing and revising one's views in case of disagreements and conflicts in intercultural communication
GC-6. Able to identify and implement the priorities of their own activities and ways to improve it based on self-esteem.	**GC-6.1** can evaluate resources and their limits (personal, situational, temporary), use them appropriately
	GC-6.2 capable to determine educational needs and ways to improve their own (including professional) activities based on self-assessment
	GC -6.3 owns skills building a flexible professional trajectory, taking into account the accumulated experience of professional activity, dynamically changing labor market requirements and personal development strategies
GC-7. Able to use digital technologies and methods of searching, processing, analyzing, storing and presenting information (in the field of Ecology and nature management) in the digital economy and modern corporate information culture.	**GC-7.1** owns the skills of digital technologies use and search methods
	GC-7.2 can process, analyze, store and correctly present information
	GC-7.3 knows the principles and techniques of modern corporate information culture and the digital economy basics
GPC-1. Able to use philosophical concepts and methodology of scientific creation in the study of various levels of matter, space and time organization.	**GPC-1.1** Knows the philosophical concepts of natural science and methodology of scientific creation
	GPC-1.2 Able to use in-depth knowledge in the philosophical concepts of natural science in assessing the professional activities consequences
	GPC-1.3 Able to apply the acquired knowledge in the research activities, to make correct generalizations and conclusions
GPC-2. Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity.	**GPC-2.1** Knows the basics of ecology, geoecology, environmental economics and circular economy, as well as environmental management
	GPC-2.2 Able to use environmental, economic and other special knowledge and algorithms to solve professional problems
	GPC-2.3 Capable of finding, analyzing and competently using latest information and modern

	techniques in the research and applied tasks performance
GPC-3. Able to apply environmental research methods to solve research and applied problems of professional activity.	**GPC-3.1** Knows the principles and methods of environmental monitoring related with different environmental components
	GPC-3.2 Owns analytical methods of pollutants control, physical impacts and processing of the received information
	GPC-3.3 Able to develop environmental monitoring and control systems in production and solve applied problems in professional activities
GPC-4. Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management.	**GPC-4.1** Knows the environmental regulation and legislation basics in the field of nature management
	GPC-4.2 Knows how to use and apply regulatory legal acts in the field of ecology and nature management
	GPC-4.3 Able to use the professional ethics norms in their professional activities
GPC-5. Able to solve the problems of professional activity in the field of ecology, nature management and protection using information and communication, including geoinformation technologies.	**GPC-5.1** Knows how to choose and apply algorithm for solving environmental problems and implements algorithms using software
	GPC-5.2 Has the skills to use information technology tools for searching, storing, processing, analyzing and presenting information
	GPC-5.3 Able to process earth remote sensing data and use cartographic materials, owns modern GIS technologies
GPC-6. Able to design, represent, protect and disseminate the results of their professional activities, including research.	**GPC-6.1** Able to receive, analyze, summarize the necessary scientific information using modern research methods, present their own results in the form of scientific articles and public speeches
	GPC-6.2 Possesses the skills of oral report and presentation with regards to the project and scientific activities results
	GPC-6.3 Knows methodological foundations of scientific research, copyright and scientific ethics requirements
PC-1 Able to organize and manage the enterprise activities using in-depth knowledge in the field of environmental management	**PC-1.1** Knows the basics and principles of production management, the legal framework for effective environmental management, including production and consumption waste management
	PC-1.2 Able to organize the management of research, scientific and production and expert-analytical work at the enterprise
PC-2 Able to develop and economically justify plans for the introduction of new equipment and technologies to ensure minimal waste impact on the environment	**PC-2.1** Has the skills to select and implement the best available technologies (BAT) for the processing and recycling of production and consumption waste
	PC-2.2 Can economically justify plans for the introduction of new equipment and technologies for waste management, using them as a secondary resource
	PC-2.3 Capable of minimizing the waste impact on the environment

PC-3 Able to develop measures for the economic regulation of the organization's environmental activities	**PC-3.1** Able to predict socio-economic development based on environmental forecasts
	PC-3.2 Knows how to determine the economic effect of the measures application aimed at ensuring the enterprise environmental safety
PC-4 Capable of assessing the impact of economic activity on the environment	**PC-4.1** Able to conduct an environmental impact assessment (EIA) of the designed enterprise and facilities, predict and evaluate negative consequences
	PC-4.2 Able to develop standard environmental measures
	PC-4.3 Possesses the skills of environmental design and preparation with regards to special documentation at the pre-project stage of the project life cycle
PC-5 Able to analyze the causes and minimize the consequences of the production negative impact on the environment	**PC-5.1** Able to identify the causes and sources of harmful substances entering the environment and the causes and sources of solid waste generation
	PC-5.2 Has the skills to prepare proposals to eliminate the causes and eliminate the negative consequences of the impact
	PC-5.3 Ensures the plans implementation for environmental protection measures and the elimination of accumulated environmental damage objects to the environment, including the existing waste disposal sites reclamation, lands after the elimination of unauthorized dumps, etc.
PC-6 Able to coordinate activities for the organization and control in the field of production and consumption waste management	**PC-6.1** Capable of monitoring activities in the field of waste management
	PC-6.2 Has the skills to organize the infrastructure for environmentally safe disposal and processing of production and consumption waste

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The internship refers to the core component of (B2) block of the higher educational programme curriculum.

Within the higher education programme students also master other disciplines (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the internship.

Table 3.1. The list of the higher education programme components that contribute to the achievement of the expected learning outcomes as the internship results.

Competence code	**Competence descriptor**	**Previous courses/modules, internships***	**Subsequent courses/modules, internships***
GC-1	Able to carry out a critical analysis of problem situations based on a	Methodology of Scientific Creation	Final Qualifying Work

	systematic approach, develop an action strategy	Environmental Control and MSW Monitoring Programs Waste Physicochemical Methods	
GC-2	Able to manage a project at all stages of its life cycle	IT in Ecology and Natural Resources Management Methodology of Scientific Creation	Final Qualifying Work
GC-3	Able to organize and manage the work of the team, developing a team strategy to achieve the goal	Foreign Language International Cooperation in the field of Nature Protection Methodology of Scientific Creation Nature Protection and Accumulated Environmental Damage (AED) Elimination Tools Regional & Municipal MSW Management Systems	Final Qualifying Work
GC-4	Able to apply modern communication technologies, including in foreign language(s), for academic and professional interaction	Higher School Pedagogy	Final Qualifying Work
GC-5	Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	Higher School Pedagogy Foreign Language international cooperation in the field of nature protection	Final Qualifying Work
GC-6	Able to determine and implement the priorities of their own activities and ways to improve it based on self-assessment	Methodology of Scientific Creation Environmental Control and MSW Monitoring Programs Physicochemical Methods of Waste Testing	Final Qualifying Work
GC-7	Able to use basic knowledge in the field of information culture	IT in Ecology and Natural Resources Management Accumulated Environmental Damage (AED) Elimination Tools Mapping and GIS Technologies in MSW Management	Final Qualifying Work
SPC-1	Able to use philosophical concepts and methodology of scientific knowledge in the study of various levels of organization of matter, space and time	Science History and Philosophy	Final Qualifying Work

SPC-2	Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity	MSW Recycling and Utilization Technics Landscape and Geochemical Aspects of Waste Impact Regional & Municipal MSW Management Systems Basics of Circular Green Economy and Tools for Enterprises Sustainable Development	Final Qualifying Work
SPC-3	Able to apply environmental research methods to solve research and applied problems of professional activity	Biological and Sanitary Waste Safety Mapping and GIS Technologies in MSW Management Environmental Control and MSW Monitoring Programs Physicochemical Methods of Waste Testing	Final Qualifying Work
SPC-4	Able to apply regulatory legal acts in the field of ecology and nature management, norms of professional ethics	Accumulated Environmental Damage (AED) Elimination Tools national and international Aspects of Radioactive Waste Management Environmental Control and MSW Monitoring Programs Physicochemical Methods of Waste Testing	Final Qualifying Work
SPC-5	Able to solve the problems of professional activity in the field of ecology, nature management and nature protection using information and communication, including geoinformation technologies	IT in Ecology and Natural Resources Management International Cooperation in the field of Nature Protection Landscape and Geochemical Aspects of Waste Impact Ecotoxicokinetics of Waste National and International Aspects of Radioactive Waste Management Regional & Municipal MSW Management Systems Biological and Sanitary Waste Safety Mapping and GIS Technologies in MSW Management	Final Qualifying Work
SPC-6	Able to design, represent, protect and disseminate the results of their professional activities, including research	Research work including projects	Final Qualifying Work

PC-1	Able to formulate problems, tasks and methods of scientific research, obtain new reliable facts based on observations, experiments, scientific analysis of empirical data, summarize scientific works, compile analytical reviews of accumulated information in world science and production activities, generalize the results obtained in the context of previously accumulated in science knowledge and formulate conclusions and practical recommendations based on representative and original research results	Nature Protection and Accumulated Environmental Damage (AED) Elimination Tools	Final Qualifying Work
PC-2	the ability to creatively use in scientific and industrial and technological activities the knowledge of fundamental and applied sections of special disciplines of the master's program	MSW Recycling and Utilization Technics	Final Qualifying Work
PC-3	possession of the basics of design, expert-analytical activities and research using modern approaches and methods, equipment and computer systems	Landscape and Geochemical Aspects of Waste Impact Ecotoxicokinetics of Waste National and International Aspects of Radioactive Waste Management Regional & Municipal MSW Management Systems Biological and Sanitary Waste Safety	Final Qualifying Work
PC-4	the ability to use modern methods of processing and interpreting environmental information in scientific and industrial research	IT in ecology and Natural Resources Management International Cooperation in the field of Nature Protection	Final Qualifying Work
PC-5	the ability to develop standard environmental measures and assess the impact of planned structures or other forms of	Mapping and GIS Technologies in MSW	Final Qualifying Work

	economic activity on the environment		
PC-6	the ability to diagnose problems of nature conservation, develop practical recommendations for its protection and sustainable development	Nature Protection and Accumulated Environmental Damage (AED) Elimination Tools Landscape and Geochemical Aspects of Waste Impact Ecotoxicokinetics of Waste National and International Aspects of Radioactive Waste Management Regional & Municipal MSW Management Systems Biological and Sanitary Waste Safety Basics of Circular Green Economy and Tools for Enterprises Sustainable Development	Final Qualifying Work

4. INTERNSHIP WORKLOAD

The total workload of the internship is 12 credits (432 academic hours).

5. INTERNSHIP CONTENTS

*Table 5.1. Internship contents **

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Module 1. Organizational and preparatory part	Receiving an assignment for an internship from a manager, receiving advice on internships	2
	Instruction on labor protection and fire safety	2
	Research methodology choice	20
	Drawing up a work schedule on the study	20
	Literature review on the research topic using foreign literature	80
Module 2. Main part	Activities for the collection, processing and systematization of material according to the final qualification work subject	160
	Registration of final qualifying work	106
	Current internship control by the supervisor	20
Module 3. Reporting	Internship Report Preparation	20
	Report Defense	2
	TOTAL:	**432**

6. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

The infrastructure and technical support necessary for the internship implementation include following:

Audience equipment	**Specialized educational / laboratory equipment, software and materials for mastering the discipline** (if necessary)
An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	A set of specialized furniture; chalk board; hardware: HP PRO system unit, HP-V2072A monitor, LUMIEN retractable projection screen, Internet access. Microsoft Windows 7 corporate. License No. 5190227, date of issue March 16, 2010 MS Office 2007 Prof , License # 6842818, date of issue 09/07/2009
An auditorium for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations.	
An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the EIOS.	

7. INTERNSHIP LOCATION AND TIMELINE

The internship can be carried out at the structural divisions of RUDN University (at Moscow-based organisations, as well as those located outside Moscow.

The internship at an external organisation (outside RUDN University) is legally arranged on the grounds of an appropriate agreement, which specifies the terms, place and conditions for an internship implementation at the organisation.

The period of the internship, as a rule, corresponds to the period indicated in the training calendar of the higher education programme. However, the period of the internship can be rescheduled upon the agreement with the Department of Educational Policy and the Department for the Organization of Internship and Employment of RUDN students.

8. RESOURCES RECOMMENDED FOR INTERNSHIP

Main reading:

1. Kharlamova MD, Kurbatova AI Modern Technologies of Waste Management , Recycling and Environmental Protection / Modern methods of waste management, recycling and environmental protection - M. : RUDN University, 2017. - 98 p. : ill.1. Study guide in English. language 2. Electronic text data Text/electronic resource ISBN 978-5-209-07889-0: 120.68.

Additional reading:

1. Evans Virginia., Evans, J. Dooley, K. Rodgers. Environmental Engineering Book 1, 2, 3/ V . Newbery : Express Publishing , 2013. - 38, 40, 41 p Textbook in English 1 ISBN 978-1-4715-1611-5: 1365.10.

2. Golinska Paulina. : P. Golinska , M. Fertsch . Information Technologies in Environmental Engineering2011. Environmental Science and Engineering, ISSN 1863-5520 Monograph, ISBN 978-3-642-19535-8. Electronic text data http://www.springerlink.com/openurl.asp?genre=book&isbn=978-3-642-19535-8

Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) http://lib.rudn.ru/MegaPro/Web
- EL "University Library Online" http://www.biblioclub.ru
- EL "Yurayt" http://www.biblio-online.ru
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" http://e.lanbook.com/
- EL "Trinity Bridge"

2.*Databases and search engines:*

- electronic foundation of legal and normative-technical documentation http://docs.cntd.ru/
- Yandex search engine https:// www .yandex.ru/
- Google search engine https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

Scientific full-text databases. The list of databases is in alphabetical order with a description of each resource and a link. The collection of electronic resources UNIBTS (NB) contains:

- universal databases of world famous publishers and suppliers of electronic information for all scientific areas: Cambridge Journals , Oxford Journals , JSTOR , ScienceDirect Freedom _ Collection , PROQUEST DISSERTATIONS AND THESES GLOBAL, Springer Journals , Taylor & Francis Online, Wiley Online Library, etc.
- specialized databases for specific areas of knowledge: CASC, IEL IEEE, INSPEC, Reaxys / RMC , IOPSCIENCE, MathSciNET , Pathway Studio, Royal Society of Chemistry , Nature , Science online , zbMATH , scientific protocols and scientific materials in physical sciences and engineering Springer Protocols and Springer Materials , Questel patents Orbit , etc.
- full text open access databases rigorously rated by professional experts: ScienceDirect Open, Oxford Open, Palgrave Open, De Gruyter Online Open, Sage Open, Springer Open, Taylor & Francis Online
- archives scientific articles Western Publishers : AGU (Wiley), Annual Reviews, Cambridge University Press, IOP Publishing, Oxford University Press, Nature Publishing Group, Royal Society of Chemistry, SAGE Publications, Taylor and Francis, The American Association for the Advancement of Science
- Mendeley is an international scientific social network that allows you to find like-minded scientists, create scientific associations and study trends in modern research,

combine information on the user's personal computer, forming your own collection of full-text scientific papers for distribution and citation, provides an opportunity for communication, facilitates establishing contacts with colleagues who deal with similar topics. Mendeley users are scientists from universities around the world: Stanford, Harvard, Oxford, Michigan, Cambridge, etc.

The training toolkit and guidelines for a student to do an internship, keep an internship diary and write an internship report:*

1. Safety regulations to do the internship (safety awareness briefing).
2. Machinery and principles of operation of technological production equipment used by students during their internship; process flow charts, regulations, etc. (if necessary).
3. Guidelines for keeping an internship diary and writing an internship report.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL AS INTERNSHIP RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the internship results are specified in the Appendix to the internship syllabus.

DEVELOPER:

Senior Lecturer of the ES&PQM Department		**Popkova A.V.**
Position, BUP	Signature	Name, Surname

HEAD OF EDUCATIONAL DEPARTMENT:

Director of ES&PQM Department		**Savenkova E.V.**
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HEAD OF HIGHER EDUCATION PROGRAMME:

Senior Lecturer of the ES&PQM Department		**Popkova A.V.**
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