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**Federal State Autonomous Educational Institution of Higher Education  
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE  
LUMUMBA**

**Institute of Environmental Engineering**

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educational division (faculty/institute/academy) as higher education programme developer

**INTERNSHIP SYLLABUS**

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**Industrial practice**

internship title

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**Industrial practice**

internship type

**Recommended by the Didactic Council for the Education Field of:**

08.04.01 Construction

05.04.06. Ecology and environmental Management

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field of studies / speciality code and title

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

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**Environmental Engineering in Construction**

higher education programme profile/specialisation title

## 1. INTERNSHIP GOAL

The goal of the Internship is to:

- consolidation and deepening of professional knowledge acquired by students in the learning process;

- acquisition of practical skills and competencies, as well as experience, in the following areas of professional activity: design, survey, research, production, marketing, consulting, economic, legal, training, expert departments, departments, bureaus, centers, companies, institutions in the field ecology and nature management, educational organizations, professional educational organizations and educational organizations of higher education.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

The internship implementation is aimed at the development of the following competences (competences in part):

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

| <b>Competence code</b> | <b>Competence descriptor</b>  | <b>Competence formation indicators (within this course)</b>   |
|------------------------|---|---|
| GC 2                   | Selected according to the subject of research work by the student in the course of bibliographic research.  | GC -2.1. able to formulate a project task based on the problem posed and a way to solve it  |
|                        |   | GC-2.2. able to develop the concept of the project, formulates the goal, objectives, justifies the relevance, expected results and areas of their application   |
|                        |   | GC-2.3. able to develop a project implementation plan taking into account possible risks, plans the necessary resources   |
| GC 7                   | Digital literacy  | GC7.1 Searches for the necessary sources of information and data, perceives, analyzes, memorizes and transmits information using digital means, as well as using algorithms when working with data received from various sources in order to effectively use the information received to solve problems |
|                        |   | GC7.2Evaluates information, its reliability, builds logical conclusions based on incoming information and data  |
| PC 2                   | Able to diagnose environmental problems, develop standard environmental measures and practical recommendations for ensuring sustainable development, and assess the impact of planned structures or other forms of economic activity on the environment | PC 2.1Able to predict possible adverse changes in the natural and man-made environment, to conduct a preliminary analysis of the consequences of the information obtained during the study  |
|                        |   | PC 2.2Able to analyze environmental monitoring data, draw preliminary conclusions about the state of the facility and the environment   |
|                        |   | PC 2.3Able to assess the impact on the environment of the designed enterprise and facilities, predict and evaluate the negative consequences  |
| PC 4                   | Able to develop design solutions and measures to ensure the safety of   | PC4.1 Able to develop standard environmental measures, monitor the state of the environment to ensure the safety of industrial and civil construction projects  |

|        |   |   |
|--------|---|---|
|        | industrial and civil construction projects  | PC4.2 Possesses the skills of environmental design and preparation of special documentation at the pre-project stage of the project life cycle<br>PC4.3 Able to carry out the necessary calculations for planning, modeling and forecasting the development of a territorial object   |
| GPC 2э | Able to use special and new sections of ecology, geoecology and nature management in solving research and applied problems of professional activity   | GPC 2.1эHas a systematic understanding of the theoretical and methodological foundations of environmental regulation<br>GPC 2.2эKnows the basic knowledge of the fundamental sections of biology in the amount necessary to master the basics in ecology and nature management<br>GPC 2.3эOwns modern methods of obtaining and evaluating geochemical information for solving theoretical and practical problems of environmental geochemistry in the field of ecology and nature management in order to protect the environment  |
| GPC3э  | Able to apply environmental research methods to solve research and applied problems of professional activity  | GPC 3.1эKnows how to identify and has the skills to solve problems, tasks of scientific research in the field of urban geography, environmental problems of cities<br>GPC 3.2эOwns modern methods for assessing geoecological information to solve theoretical and practical problems of nature management<br>GPC 3.3эPossesses the skills of predicting meteoropropic reactions, assessing the climatic potential of regions, assessing the objectivity of climate change scenarios  |
| GPC 4э | Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management  | GPC 4.1.эOriented in the modern system of regulatory support for engineering and environmental surveys and environmental impact assessment of urban agglomerations<br>GPC 4.2.эKnows the international practice of development and harmonization, as well as the application of environmental standards<br>GPC 4.3.эHas the skills to analyze the need for environmental protection measures based on the application of environmental standards, the skills to select and apply indicators for environmental expertise and forms of environmental control based on environmental standards |
| GPC5э  | 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 | GPC 5.1.э Knows the theoretical, methodological and practical foundations for the use of information technology in environmental expertise<br>GPC 5.2.эOwns modern methods for assessing environmental information to solve theoretical and practical problems of environmental safety expertise of nature management<br>GPC 5.3.эKnows how to choose and apply an algorithm for solving environmental problems and implements algorithms using software  |
| GPC 1c | Able to solve problems of professional activity based on the use of theoretical   | GPC 1.1cAble to apply the theoretical and practical foundations of fundamental sciences in solving professional problems  |

|       |  |   |
|-------|--|---|
|       | and practical foundations, the mathematical apparatus of fundamental sciences                                      | GPC 1.2cAble to conduct a preliminary analysis of the consequences of the information obtained during the study<br>GPC 1.3cKnows how to solve professional problems based on the use of knowledge of the mathematical apparatus of fundamental sciences   |
| GPC6c | Able to carry out research of objects and processes in the field of construction and housing and communal services | GPC 6.1cAble to conduct scientific and scientific-practical research in the field of construction and housing and communal services<br>GPC 6.2cAble to evaluate the scientific and technical results obtained in Russia and (or) abroad in new and (or) promising scientific areas in the field of construction and housing and communal services<br>GPC 6.3cPossesses the skills to perform research of objects and processes in the field of construction and housing and communal services |

### 3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The internship refers to the core component of B2.B.02 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* |
|-----------------|--|---|--|
| GC1             | Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy | Mathematical modelling<br>Fundamentals of scientific research<br>Educational practice         | -  |
| GC2             | Able to manage a project at all stages of its life cycle   | Organization and management in construction   | -  |
| GC3             | Able to organize and manage the work of the team, developing a team strategy to achieve the goal.                      | Leadership and Team management  | -  |
| GC4             | Able to apply modern communication technologies, including in a  | Mathematical modelling<br>Leadership and Team management<br>Foreign language for professional | -  |

| <b>Competence code</b> | <b>Competence descriptor</b>   | <b>Previous courses/modules, internships*</b>  | <b>Subsequent courses/modules, internships*</b> |
|------------------------|--|--|---|
|                        | foreign language(s) for academic and professional interaction  | communication  |   |
| GC5                    | Able to analyze and take into account the diversity of cultures in the process of intercultural interaction  | Leadership and Team management   | -   |
| GC6                    | Able to identify and implement the priorities of their own activities and ways to improve it based on self-assessment                                | Leadership and Team management   | -   |
| GC7                    | Digital technologies   | Regulation System in Construction<br>Digital technologies in Civil Engineering   | -   |
| GPC 1ə                 | Able to use philosophical concepts and methodology of scientific knowledge in the study of various levels of organization of matter, space and time. | Fundamentals of scientific research<br>Educational practice<br>Sustainable development of urban areas  | -   |
| GPC 2ə                 | Able to use special and new sections of ecology, geocology and nature management in solving research and applied problems of professional activity   | Fundamentals of scientific research<br>Urban water management and climate change adaptation<br>Dynamics of environmental systems<br>Educational practice<br>Regional geocology and urban geocology<br>Regional and municipal waste management systems<br>Sustainable development | -   |

| <b>Competence code</b> | <b>Competence descriptor</b>  | <b>Previous courses/modules, internships*</b>   | <b>Subsequent courses/modules, internships*</b> |
|------------------------|---|---|---|
|                        |   | of urban areas  |   |
| GPC 3ᅇ                 | Able to apply environmental research methods to solve research and applied problems of professional activity  | Urban water management and climate change adaptation<br>Project management<br>Urban development and environmental engineering surveys   | -   |
| GPC 4ᅇ                 | Able to apply regulatory legal acts and norms of professional ethics in the field of ecology and nature management  | Regulation System in Construction<br>Project management<br>Industry practice<br>Environmental rationing   | -   |
| GPC 5ᅇ                 | 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 | Mathematical modelling<br>Organization and management in construction<br>Digital technologies in Civil Engineering  | -   |
| GPC 6ᅇ                 | Able to design, represent, protect and disseminate the results of their professional activities, including research   | Project management<br>Industry practice   | -   |
| GPC 1c                 | Able to solve problems of professional activity based on the use of theoretical and practical foundations, the mathematical apparatus of fundamental sciences                                   | Mathematical modelling<br>Fundamentals of scientific research<br>Organization and management in construction<br>Digital technologies in Civil Engineering<br>Theoretical foundations and design methods of pipeline systems for water supply and sanitation | -   |

| Competence code | Competence descriptor   | Previous courses/modules, internships*   | Subsequent courses/modules, internships* |
|-----------------|---|--|--|
| GPC 2c          | Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology   | Mathematical modelling<br>Organization and management in construction<br>Management of operation of water supply and sanitation systems<br>Dynamics of environmental systems<br>Educational practice | -  |
| GPC 3c          | Able to set and solve scientific and technical problems in the field of construction, the construction industry and housing and communal services based on knowledge of the problems of the industry and experience in solving them | Theoretical foundations and design methods of pipeline systems for water supply and sanitation<br>Educational practice   | -  |
| GPC 4c          | Able to use and develop design, administrative documentation, as well as participate in the development of regulatory legal acts in the field of the construction industry and housing and communal services                        | Regulation System in Construction<br>Industry practice   | -  |
| GPC 5c          | Able to conduct and organize design and survey work in the field  | Digital technologies in Civil Engineering<br>Regional geocology and urban geocology  | -  |

| <b>Competence code</b> | <b>Competence descriptor</b>   | <b>Previous courses/modules, internships*</b>   | <b>Subsequent courses/modules, internships*</b> |
|------------------------|--|---|---|
|                        | of construction and housing and communal services, carry out technical expertise of projects and supervision of their compliance                         |   |   |
| GPC 6c                 | Able to carry out research of objects and processes in the field of construction and housing and communal services                                       | Fundamentals of scientific research   | -   |
| GPC 7c                 | Able to manage an organization operating in the construction industry and housing and communal services, organize and optimize its production activities | Leadership and Team management<br><br>Sustainable development of urban areas  | -   |
| PC 1                   | Able to conduct an examination of design solutions for industrial and civil construction projects, incl. and in the field of rational nature management  | Organization and management in construction<br>Project management<br>Management of operation of water supply and sanitation systems<br>Life cycle analysis of construction object<br>Hydrological Modelling<br>Modeling of water supply and wastewater disposal systems | -   |
| PC 2                   | Able to diagnose environmental problems, develop standard environmental measures and practical recommendations for ensuring                              | Urban water management and climate change adaptation<br>Assessments of water bodies environment of urban areas<br>Urban Ecosystems<br>Environmental control and monitoring of urban   | -   |



| Competence code | Competence descriptor  | Previous courses/modules, internships*  | Subsequent courses/modules, internships* |
|-----------------|--|---|--|
|                 | sustainable development, and assess the impact of planned structures or other forms of economic activity on the environment                        | environment<br>Educational practice<br>Industry practice<br>Blue-green urban infrastructure<br>Green areas and protected areas in the city<br>Regional geocology and urban geocology<br>Urban development and environmental engineering surveys<br>Sustainable development of urban areas   |  |
| PC 3            | Able to carry out and organize scientific research of objects of industrial and civil construction, incl. in the field of environmental management | Fundamentals of scientific research<br>Theoretical foundations and design methods of pipeline systems for water supply and sanitation<br>Project management<br>Social adaptation of persons with disabilities in the conditions of professional activity<br>Life cycle analysis of construction object<br>Blue-green urban infrastructure<br>Green areas and protected areas in the city<br>Regional geocology and urban geocology<br>Urban development and environmental engineering surveys | -  |
| PC 4            | Able to develop design solutions and measures to ensure the safety of industrial and civil construction projects                                   | Theoretical foundations and design methods of pipeline systems for water supply and sanitation<br>Project management<br>Regional and municipal waste management systems<br>Environmental rationing  | -  |
| PC 5            | Able to develop design solutions and organize  | Organization and management in construction   | -  |

| Competence code | Competence descriptor                                    | Previous courses/modules, internships*  | Subsequent courses/modules, internships* |
|-----------------|--|---|--|
|                 | design in the field of industrial and civil construction | <p>Theoretical foundations and design methods of pipeline systems for water supply and sanitation</p> <p>Management of operation of water supply and sanitation systems</p> <p>Natural water conditioning systems</p> <p>Industry practice</p> <p>Social adaptation of persons with disabilities in the conditions of professional activity</p> <p>Life cycle analysis of construction object</p> <p>Modeling of water supply and wastewater disposal systems</p> <p>Hydrological Modelling</p> |  |

\* To be filled in according with the competence matrix of the higher education programme.

#### 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          | Getting an internship assignment from a supervisor                                   | 2                        |
|  | Instruction on labor protection and fire safety                                      | 2                        |
|  | Familiarization with the conditions of internship                                    | 2                        |
|  | Familiarization with job responsibilities at the place of internship                 | 2                        |
|  | Acquaintance with the enterprise, organization                                       | 6                        |
| Module 2.Basic Independent work, incl. under the | Bibliographic stage: collection, processing and systematization of literary material | 90                       |
|  | Writing a literature review  | 90                       |

| <b>Modules</b>  | <b>Contents (topics, types of practical activities)</b>   | <b>Workload, academic hours</b> |
|---|---|---------------------------------|
| guidance of leaders from the faculty and organization     | Experimental research stage: performance of production tasks, observations, measurements, sampling. | 90                              |
|   | Processing and analysis of results  | 60                              |
|   | Compilation of graphic and cartographic material  | 48                              |
| Writing an internship report                              |   | 30                              |
| Preparing for defence and defending the internship report |   | 10                              |
| <b>TOTAL:</b>   |   | <b>432</b>                      |

\* The contents of internship through modules and types of practical activities shall be FULLY reflected in the student's internship report.

## **6. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS**

The infrastructure and technical support necessary for the internship implementation include: laboratory equipment for determining pollution, transport for field research, cartographic material, satellite images, laboratory equipment for compression and shear testing of soils, field analyzers of air and soil pollution, computers with professional software, special equipment for various types of work in the field of ecology and nature management, depending on the profile of the organization, computer, database, professional software.

## **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 readings:*

1. Исследование природных экосистем. Самостоятельные работы для летней полевой практики. Учебно-методическое пособие для студентов экологических специальностей. / Алейникова А. М., Ванисова Е. А., Васильева Е. Ю., Горбунов С. С., Жмылёв П. Ю., Жмылёва А. П., Стомахина Е. Д., Уланская Ю. В. – М.: Издательство РУДН, 2015

2. Станис Е.В. Дневник производственной (преддипломной, научно-исследовательской, научно-практической, научно-педагогической) практики. Издательство РУДН, 2014. –10 С.

3. Станис Е.В. Положения и программы по производственной и научно-исследовательской практикам по направлению 022000 - «Экология и природопользование» [Текст] - / Станис Е.В. - М.: 2012.

4. Станис Е.В., Макарова М.Г. Методические рекомендации по организации и проведению научно-исследовательской работы в магистратуре по направлению 022000 «Экология и природопользование» - М.: Издательство РУДН, 2011

*Additional readings:*

Selected according to the subject of research work by the student in the course of bibliographic research.

*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](http://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/>

*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.

\*The training toolkit and guidelines for the internship are placed on the internship page in the university telecommunication training and information system under the set procedure.

## **9. 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.

\* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

**DEVELOPERS:**

Associate Professor of the  
Department of environmental  
management

position, educational department



signature

Kucher D.E

name and surname.

**HEAD OF EDUCATIONAL DEPARTMENT:**

Director of the Department  
of Environmental Management

educational department



signature

Kucher D.E

name and surname.

**HEAD OF  
HIGHER EDUCATION PROGRAMME:**

Director of the Department  
of Environmental Management

position, educational department



signature

Kucher D.E

name and surname