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

Academy of Engineering

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

INTERNSHIP SYLLABUS

Technological Practice

internship title

Advanced field internship

internship type

Recommended by the Didactic Council for the Education Field of:

08.04.01 Civil Engineering

field of studies / speciality code and title

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

Civil Engineering and Built Environment

higher education programme profile/specialisation title

1. INTERNSHIP GOAL(s)

The goal of the Internship is to deepen, systematize and consolidate theoretical knowledge related to all technological stages of construction, as well as to acquire skills and abilities when performing final qualification work, including the formation and development of practical skills and competencies of the master, the acquisition of experience in independent professional activity.

The main objectives of the Internship are:

- to study the information, domestic and foreign experience of construction technologies on the topic of final qualifying work;
- learn how to set practical tasks, choose methodological methods and means of solving them using modern technologies, process data for writing a final qualifying work;
- master the skills and basic technological techniques of the sequence and methodology of designing buildings and structures or their main elements (in accordance with the topic of the work).

2. REQUIREMENTS FOR LEARNING OUTCOMES

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1	Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-1.1 Analyzes the problem, identifying its basic components; GC-1.2 Identifies and ranks the information required to solve the task; GC-1.3 Selects ways to solve the problem, analyzes the possible consequences of their use
GPC-3	Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-3.2 Able to set and solve scientific and technical tasks in the field of technology, organization, management of construction and operation of capital construction projects
GPC-4	Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-4.3 Able to use normative legal acts in the field of construction industry and housing and communal services, as well as to participate in their development
GPC-5	Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-5.2 Capable of conducting and organizing technical expertise of projects and author's supervision of their observance
GPC-7	Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production	GPC-7.3 Capable of controlling and accepting work in the design, construction and operation of capital construction projects; GPC-7.4 Knows the order of interaction with the customer, the delivery of completed work in the design,

	activities	construction, operation of capital construction objects; GPC-7.5 Able to develop measures to improve the efficiency of work in the design, construction, operation of capital construction projects
PC-2	Development of project products based on the results of engineering and technical design for urban development activities	PC-2.3 Is able to perform organizational and technological design and develop construction organization projects and work production projects
PC-3	Organizational, technical and technological preparation of construction production	PC-3.1 Able to carry out scheduling of construction works; PC-3.2 Knows how to choose the required material, labor resources and construction equipment for the production of works; PC-3.3 Knows how to choose suitable techniques, methods of work; PC-3.4 Able to plan control over the production of construction works, including compliance with safety during the production of works; PC-3.5 Able to develop organizational and technological documentation
PC-5	Organization of construction works at the capital construction facility	PC-5.1 Knows how to determine the required resources to perform the work; PC-5.2 Able to carry out scheduling of works; PC-5.3 Able to identify and take into account regulatory, legislative requirements, project requirements and organizational and technological documentation for the production of construction works; PC-5.4 Capable of performing operational management, monitoring the progress of work; PC-5.5 Able to carry out technical control, supervision, acceptance of construction works

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The Technological Practice internship refers to the variable 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 critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	Problem solving techniques in Civil Engineering; Numerical methods for Civil Engineering; Mathematical Modelling; Geoinformation Systems and Applications; Independent Research Work (obtaining basic skills of	Final State Examination

		research work)	
GPC-3	Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	Mathematical Modelling; Digital technologies in construction; Project management; BIM-Technology in Construction Management; Independent Research Work (obtaining basic skills of research work)	Final State Examination
GPC-4	Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	Digital technologies in construction; Project management; Life Cycle Economics of Buildings; BIM-Technology in Construction Management	Final State Examination
GPC-5	Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	Digital technologies in construction; Project management; Life Cycle Economics of Buildings; BIM-Technology in Construction Management	Final State Examination
GPC-7	Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities	Problem solving techniques in Civil Engineering; Project management; BIM-Technology in Construction Management	Final State Examination
PC-2	Development of project products based on the results of engineering and technical design for urban development activities	Digital technologies in construction; Life Cycle Economics of Buildings; Structural Design in Steel; Nanotechnology in Civil Engineering; Structural Design in Reinforced Concrete: Special Topics; Structural Dynamics; Structural Design in Reinforced Concrete; Building materials: Special Topics; Structural Design in Steel: Special Topics; Modelling of Construction Processes;	Final State Examination

		Applications of Finite Element Method for Civil Engineering problems; Sustainability in Civil Engineering; Optimization Methods in Civil Engineering; Structural Stability; Geometric Shaping and Analysis of Shells; Engineering Systems of Buildings	
PC-3	Organizational, technical and technological preparation of construction production	Project management; Life Cycle Economics of Buildings; BIM-Technology in Construction Management; Modelling of Construction Processes	Final State Examination
PC-5	Organization of construction works at the capital construction facility	Project management; Life Cycle Economics of Buildings; BIM-Technology in Construction Management; Modelling of Construction Processes	Final State Examination

4. INTERNSHIP WORKLOAD

The total workload of the internship Technological Practice is 6 credits (216 academic hours).

5. INTERNSHIP CONTENTS

*Table 5.1. Internship contents**

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Organizational and preparatory	Receiving an individual task for practice from the head	2
	Briefing on safety at the workplace (in the laboratory and / or in production)	2
Basic	Examination of the working documentation of the construction object. Work as a foreman, engineer. Study of technological maps of preparatory, construction, finishing and communication cycles in the production of construction works. Departure to the construction site.	94
	Current control of the internship by the head	4
	Keeping an internship diary	2
	Preparation of a report on the internship	2
Reporting	Intermediate assessment (preparation for the defense and defense of the report)	2
	TOTAL:	108

* 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 of hydrological and technical safety of hydraulic structures.

Computer class. Multimedia. Interactive board.

Laboratory and research bench for water supply.

Laboratory and research stand for heating

Laboratory and research stand for ventilation.

Laboratory equipped with the following equipment: modernized HMS-50 tensile testing machine, GMS-20 tensile testing machine, PG-100 press, KMU-5 twisting machine, 2PG-2.5 press, TR-294 lever strain gauges, 3UKPA-5 Aistov device, calipers, deflectometer - indicators of movement of the pointer type, desktop drilling machine NS-12Az, printer HP LJ 1012W sch. Peleng-500 diaprector, HP Presario CQ61 laptop, demo models, and installations.

7. INTERNSHIP LOCATION AND TIMELINE

The internship Technological Practice 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.

Main internship locations:

- laboratories of the Department of Civil Engineering;
- organizations (enterprises) for the construction, installation, repair and reconstruction of buildings, structures, their parts, and individual constructs (specialized organizations);
- research, design and development institutions and firms;
- firms for the production of building structures and products, the introduction of experimental materials and technologies for construction;
- construction laboratories, quality and certification centers, customer and supervision services, etc.

The student himself can come up with an initiative about the place of internship. The direction of the organization's professional activity offered to students for internship must correspond to the profile of the educational program and the types of professional activity for which the graduate of the program is preparing. The place of internship must be agreed with the head of the department, followed by (if the decision is positive) the conclusion of an appropriate agreement with the organization proposed by the student.

Students with disabilities and/or those who are classified as "disabled" undergo practical training, in an accessible form for them, in the laboratories of the university, as well as in specialized organizations with which relevant agreements have been concluded and which have the opportunity (equipment, special facilities, and infrastructure) for working with these categories of citizens.

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. Schreiber, K.A. Production technology of repair and construction works: monograph / K.A. Schreiber. - Moscow: ACB Publishing House, 2014. - 261 p. : illustrations, tables, schemes. - Bibliography: p. 258 - ISBN 978-5-4323-0038-6; Access mode: <http://biblioclub.ru/index.php?page=book&id=312360>.
2. Shirshikov, B.F. Reconstruction of objects: (Organization of work. Limitations. Risks): monograph / B.F. Shirshikov, M.N. Ershov. - Moscow: ACB Publishing House, 2010. - 115 p. : tab., scheme., ill. - Bibliography. in book. - ISBN 978-5-93093-760-2; Access mode: <http://biblioclub.ru/index.php?page=book&id=273821>.
3. Mikhailov A.Yu., Technology and organization of construction. Workshop [Electronic resource]: Textbook / Mikhailov A.Yu. - M. : Infra-Engineering, 2018. - 196 p. - ISBN 978-5-9729-0140-1 - Access mode: <http://www.studentlibrary.ru/book/ISBN9785972901401.html>

Additional readings:

1. Komarov A.S., Construction technology of water supply and sanitation systems and facilities [Electronic resource]: textbook / A.S. Komarov, O.A. Ruzhitskaya - M. : Publishing house MISI - MGSU, 2017. - 81 p. - ISBN 978-5-7264-1751-6 - Access mode: <http://www.studentlibrary.ru/book/ISBN9785726417516.html>
2. Ivanov E.S., Technology and organization of work in the construction of environmental and water management facilities [Electronic resource] / E.S. Ivanov - M.: DIA Publishing House, 2017. - 560 p. - ISBN 978-5-4323-0018-8 - Access mode: <http://www.studentlibrary.ru/book/ISBN9785432300188.html>
3. Revich Ya.L., Technology of building production [Electronic resource]: Textbook / Revich Ya. L., Rudomin E.N., Mazhaisky Yu.A. etc. - M. : DIA Publishing House, 2011. - 376 p. - ISBN 978-5-93093-798-5 - Access mode: <http://www.studentlibrary.ru/book/ISBN9785930937985.html>

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/](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. Guidelines for internship, maintenance of current and preparation of reporting documentation for students in the direction 08.04.01 Construction.

*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.

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.

* 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).