

THE WORKING PROGRAM OF THE DISCIPLINE

Name of the discipline «**Scientific seminar**»

Рекомендуется для направления подготовки/специальности

08.06.01 Engineering and construction technologies

Направленность программы (профиль)

05.23.17 Structural mechanics

1. Goals and objectives of the discipline:

The purpose of mastering the discipline «Scientific seminar» is to acquire knowledge, skills, and experience in the field of solving scientific and technical problems in construction, taking into account and using modern materials and technologies that characterize the stages of the formation of competencies and ensure the achievement of the planned results of mastering the educational program.

The main objectives of the discipline are:

- development of innovative materials, technologies, structures and systems, including using scientific achievements;
- organization and improvement of the production process at an enterprise or site, control over the observance of technological discipline, maintenance of technological equipment and machines;
- mathematical modeling of processes in structures and systems, computer methods for the implementation of models, development of calculation methods and design automation tools;
- setting up and conducting experiments, metrological support, collection, processing and analysis of results, identification of theory and experiment;
- presentation of the results of the work performed, the organization of the implementation of research results and practical developments;
- assessment of the technical condition of buildings, structures, their parts and engineering equipment, development of expert opinions.

2. Place of discipline in the structure of EP HE:

The discipline «Scientific seminar» refers to the variable part of block 1 of the curriculum.

Table 1 shows the previous and subsequent disciplines aimed at the formation of discipline competencies in accordance with the competence matrix of EP HE.

Table No. 1

Prior and subsequent disciplines aimed at the formation of competencies

№	Code and name of competence	Preceding disciplines	Subsequent disciplines (groups of disciplines)
General cultural competences			
	GC-3		State Exam. PhD Qualification Thesis and Presentation.
General professional competencies			
	GPC-5, GPC-6, GPC-7		Building designs, buildings and constructions: the theory of buildings and structures. Advanced structural mechanics. Technology and Organization of Construction. Scientific Research. Scientific Research 2. State Exam. PhD Qualification Thesis and Presentation.
Professional competencies (type of professional activity of a civil engineer)			
	PC-1	Methodology of Scientific Research. Technology and Organization of Construction. Analysis and Design of Structural Systems.	Building designs, buildings and constructions: the theory of buildings and structures. Practice in Obtaining Professional Skills and Professional Experience (Research Practice).

		Scientific Research.	Scientific Research. Scientific Research 2. State Exam. PhD Qualification Thesis and Presentation.
Vocational Competencies of Specialization Structural mechanics			

3. Requirements for the results of mastering the discipline:

The process of studying the discipline is aimed at the formation of the following competencies:

- willingness to participate in the work of Russian and international research teams to solve scientific and scientific and educational problems (GC-3);
- the ability to professionally present the results of their research and present them in the form of scientific publications and presentations (GPC-5);
- the ability to develop new research methods and their application in independent research activities in the field of construction (GPC-6);
- readiness to organize the work of the research team in the field of construction (GPC-7);
- possession of methods for the development of scientific and methodological foundations of research, improvement, theoretical, experimental and feasibility study of the use of various technical solutions and technologies in construction (PC-1).

As a result of studying the discipline, the student must:

Know:

- features of scientific and technical problems in construction; patterns and features of its organization;
- requirements for products and the quality of information support for construction services, methods of providing it;
- principles of methodological support of research work;
- principles of operation of modern research equipment and instruments;
- basic principles and methods for the development of scientific and methodological foundations of research, improvement, theoretical, experimental and feasibility study of the application of various technical solutions.

Be able to:

- use the methods of scientific research in construction; to use scientific and technical technologies in scientific research;
- use information technology in research activities;
- to use information technologies of entrepreneurial activity;
- to carry out experimental and theoretical research using modern research equipment and instruments;
- the use of basic principles and methods of theoretical, experimental and feasibility study of various technical solutions in construction.

Own:

- scientific and technical support of construction enterprises;
- organization of meeting the needs of construction;
- organization of research work in construction;
- the acquisition of the ability to assess the correctness of the calculation results;
- to carry out an experimental and feasibility study of various technical solutions and technologies in construction.

4. Scope of discipline and types of educational work

The total workload of the discipline is 6 credit units.

Type of educational work	Total hours	Semesters					
		1	2	3	4	5	6
Classroom lessons (total)	94	18	18	20	18	10	10
Including:	-	-	-	-	-	-	-
<i>Lectures</i>	-	-	-	-	-	-	-
<i>Practical lessons (PL)</i>	94	18	18	20	18	10	10
<i>Seminars (S)</i>	-	-	-	-	-	-	-
<i>Laboratory work (LW)</i>	-	-	-	-	-	-	-
Independent work (total)	122	18	18	16	18	26	26
Total labor intensity	hour	216	36	36	36	36	36
	credits	6	1	1	1	1	1

5. Content of the discipline

5.1. Contents of discipline sections

№	The name of the discipline section	Section content (topics)
1.	Organization of research work in universities and research institutions in Russia	Management in the field of science. Classification of scientific organizations. Organization of scientific research in universities and scientific organizations. Academic degrees and academic titles. Training of scientific and scientific-pedagogical personnel. Preparation of masters. Postgraduate studies. Doctorate. Competition.
2.	Science and scientific research	Science concept. Classification of Sciences. Scientific research: concept and classification. Research levels. Problem, hypothesis and theory as structural components of theoretical knowledge. Structural elements of the theory. Facts, theoretical generalizations and laws as structural elements empirical research. Stages of research work.
3.	Methods and methodology of scientific research	The concept of the method of scientific research. Classification of methods. The concept of scientific research methodology. The concept of the methodology of scientific research of technical sciences. Research methodology levels. General scientific methods of scientific research. Empirical level methods: observation, description, counting, measurement, comparison, experiment, modeling.
4.	Preparatory stage of research work	Choosing a research topic. Research planning. Scientific research work program. Methodological and procedural sections of the program. Drawing up plans for master's theses.
5.	Search, collection and processing of scientific information	The main sources of scientific information. Classification of sources of scientific information. Classification of publications. Types of scientific publications. Types of educational publications. Reference and information publications. Bibliographic, abstract and survey publications on technical sciences. Periodical and continuing publications on technical sciences. Search for literary sources. Study of special technical literature. Learning technical practice. Sources of published technical practice. Sources of unpublished technical practice. Study of statistical materials.
6.	Fundamentals of Invention	Invention: objects and conditions of patentability. Stages of development of an invention: patent search, preliminary study,

		technical design, detailed design. The stages of the invention in the application. Structural diagrams of the invention to the application for the device and to the application for the method. Rules for filing an application for an invention and utility model.
7.	Writing and formatting scientific papers	The structure of educational and scientific work. Headings. Rules for dividing text into chapters and paragraphs. Abbreviations of words. Word abbreviation rules. Table decoration. Output. A graphic way of presenting illustrative material. Scheme. Bibliographic apparatus design. Compilation and design of a bibliographic list of sources used. Grouping of sources in bibliographic references. Requirements for printing the manuscript.

5.2. Sections of disciplines and types of classes

No.	Discipline section No.	Lectures.	Practice	Lab. works	Seminars	Independent work of students	Total hour.
1.	1.	-	18	-	-	18	36
2.	2.	-	18	-	-	18	36
3.	3.	-	10	-	-	8	18
4.	4.	-	10	-	-	8	18
5.	5.	-	18	-	-	18	36
6.	6.	-	10	-	-	26	36
7.	7.	-	10	-	-	26	36

6. Laboratory workshop

No laboratory workshop provided.

7. Practical exercises (seminars)

No.	Discipline section No.	Subjects of practical classes (seminars)	Labor capacity (hour.)
1.	1.	Management in the field of science. Classification of scientific organizations. Organization of scientific research in universities and scientific organizations. Academic degrees and academic titles. Training of scientific and scientific-pedagogical personnel. Preparation of masters. Postgraduate studies. Doctorate. Competition.	18
2.	2.	Science concept. Classification of Sciences. Scientific research: concept and classification. Research levels. Problem, hypothesis and theory as structural components of theoretical knowledge. Structural elements of the theory. Facts, theoretical generalizations and laws as structural elements empirical research. Stages of research work.	18
3.	3.	The concept of the method of scientific research. Classification of methods. The concept of scientific research methodology. The concept of the methodology of scientific research of technical sciences. Research methodology levels. General scientific methods of scientific research. Empirical level methods: observation, description, counting, measurement, comparison, experiment, modeling.	10

4.	4.	Choosing a research topic. Research planning. Scientific research work program. Methodological and procedural sections of the program. Drawing up plans for master's theses.	10
5.	5.	The main sources of scientific information. Classification of sources of scientific information. Classification of publications. Types of scientific publications. Types of educational publications. Reference and information publications. Bibliographic, abstract and survey publications on technical sciences. Periodical and continuing publications on technical sciences. Search for literary sources. Study of special technical literature. Learning technical practice. Sources of published technical practice. Sources of unpublished technical practice. Study of statistical materials.	18
6.	6.	Invention: objects and conditions of patentability. Stages of development of an invention: patent search, preliminary study, technical design, detailed design. The stages of the invention in the application. Structural diagrams of the invention to the application for the device and to the application for the method. Rules for filing an application for an invention and utility model.	10
7.	7.	The structure of educational and scientific work. Headings. Rules for dividing text into chapters and paragraphs. Abbreviations of words. Word abbreviation rules. Table decoration. Output. A graphic way of presenting illustrative material. Scheme. Bibliographic apparatus design. Compilation and design of a bibliographic list of sources used. Grouping of sources in bibliographic references. Requirements for printing the manuscript.	10

8. Material and technical support of the discipline:

Auditorium with a list of logistics	Location
<p>Lecture room - Specialized room number 298 - "Modeling of large-span building structures"</p> <p>Equipment and furniture:</p> <ul style="list-style-type: none"> - a set of specialized furniture; - chalk board; - projection screen; - multimedia projector EPSON EMP-X5. 	Moscow, st. Ordzhonikidze, 3
<p>Classroom for practical training, monitoring and intermediate certification - Computer class No. 352 Laboratory of Hydrological and Technical Safety of Hydraulic Structures.</p> <p>Equipment and furniture:</p> <ul style="list-style-type: none"> - a set of specialized furniture; - chalk board; - interactive whiteboard PolyVision Webster TSL 610; - Toshiba TLP XC3000 multimedia projector; - roll-up wall screen Draper Luma 178x178; - computer Pirit Codex 1226 - 1 pc .; - sound amplifying equipment GENIUS SP-i350 - 1 piece; - Xerox 3125 printer - 1 pc .; 	Moscow, st. Ordzhonikidze, 3

<ul style="list-style-type: none"> - Scanner Epson 10V Photo - 1 pc .; - plotter HP DesignJet 130+ NR (A1) - 1 pc .; - Pirit Doctrina computers - 9 pcs.; - LCD ViewSonic 22 "VA2216w monitor - 9 pcs.; - 19 "NEC monitor - 1 pc. 	
<p>Educational-methodical room for independent, research work of students № 352 - computer class of the Laboratory of Hydrological and Technical Safety of Hydraulic Structures.</p> <p>Equipment, furniture, technical means:</p> <ul style="list-style-type: none"> - a set of specialized furniture; - chalk board; - interactive whiteboard PolyVision Webster TSL 610; - Toshiba TLP XC3000 multimedia projector; - roll-up wall screen Draper Luma 178x178; - Pirit Codex 1226 computer - 1 pc .; - sound amplifying equipment GENIUS SP-i350 - 1 piece; - Xerox 3125 printer - 1 pc .; - Scanner Epson 10V Photo - 1 pc .; - plotter HP DesignJet 130+ NR (A1) - 1 pc .; - Pirit Doctrina computers - 9 pcs .; - LCD ViewSonic 22 "VA2216w monitor - 9 pcs .; - 19 "NEC monitor - 1 pc. <p>(RUDN University software: Plaxis 2D Suit (Network license). Plaxis Professional (version 8) + Plaxis Dinamics Modul + PlaxFlow (version 1) - Education Registration number 90-07-019-00261-3 MS-office corporate, Registration code: 86626883 Parent program: 86493330 Status: Active).</p>	<p>Moscow, st. Ordzhonikidze, 3</p>

9. Information support of the discipline

a) *software*

The use of specialized software in the study of the discipline is not provided.

b) *databases, reference and search systems*

- electronic fund 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/>
- Site of the Ministry of Construction and Housing and Communal Services of the Russian Federation <http://www.minstroyrf.ru/>
- Electronic library system RUDN - EBS RUDN
<http://lib.rudn.ru/MegaPro/Web>
- EBS "University Library Online" <http://www.biblioclub.ru>
- EBS Yurayt <http://www.biblio-online.ru>
- EBS "Student Consultant" www.studentlibrary.ru
- EBS "Doe" <http://e.lanbook.com/>

10. Educational and methodological support of the discipline:

a) *main literature*

1. A.P. Svintsov Methods for solving scientific and technical problems in construction: Educational and methodological complex. M. Publishing house of RUDN. 2018.101 p.
2. Kashirin V.P. Theory of scientific research / V.P. Kashirin. –Krasnoyarsk: Krasnoyarsk state. Agrarian un-t, 2007 . - 184 p.
3. Sidnyaev N.I. Theory of experiment planning and analysis of statistical data / N.I. Sidnyaev. –M.: Yurayt, 2011. - 399 p.

b) additional literature

1. Planning an experiment in examples and calculations NI Bogdanovich et al.; -Arkhangelsk: Northern (Arctic) Federal University, 2010. - 126 p.
2. Rykov V.V. Mathematical statistics and experiment planning. - M.: MAX Press. 2010 -303 p.
3. Kim E. N. Planning and organization of the experiment. / E. N. Kim, E. P. Lapteva-Vladivostok: Dalrybvtuz, 2009 - 188 p.
4. Rozhkov N. F. - Planning and organization of a measuring experiment. / N.F. Rozhkov. -Omsk: Publishing house of OmSTU, 2009 .- 106 p.

11. Methodical instructions for students on mastering the discipline (module)

Methodological instructions for the implementation of students' IWS are contained in the book: A.P. Svintsov Methods for solving scientific and technical problems in construction: Educational and methodological complex. M. Publishing house of RUDN. 2018.101 p.

12. Fund of assessment tools for intermediate certification of students in the discipline (module)

The fund of assessment tools, formed for the current monitoring of progress and intermediate certification of students in the discipline "Scientific seminar" is presented in Appendix 1 to the work program of the discipline and includes:

- a list of competencies formed in the course of studying the discipline;
- description of indicators and criteria for assessing competencies, description of assessment scales;
- typical control tasks or other materials necessary to assess knowledge, skills, skills and (or) experience of activities, characterizing the level of competence formation;
- methodological materials that determine the procedures for assessing knowledge, skills, skills and (or) experience of activities, characterizing the level of competence formation.

The program has been drawn up in accordance with the requirements of the ES of HE RUDN.

Developer:

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