

Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ястребов Олег Александрович
Должность: Ректор
Дата подписания: 08.07.2022 17:02:01
Уникальный программный ключ:
ca953a0120d891083f939673078ef1a989dae18a

**Федеральное государственное автономное образовательное учреждение
высшего образования «Российский университет дружбы народов»**

Инженерная Академия

(наименование основного учебного подразделения (ОУП)-разработчика программы аспирантуры)

Департамент строительства

(наименование базового учебного подразделения (БУП)-разработчика программы аспирантуры)

THE WORKING PROGRAM OF THE DISCIPLINE

РАБОЧАЯ ПРОГРАММА ДИСЦИПЛИНЫ

Building designs, buildings and constructions: the theory of buildings and structures

(наименование дисциплины/модуля)

Научная специальность:

**2.1.1. Building designs, buildings and constructions / Строительные конструкции,
зданий и сооружения (англ.)**

(код и наименование научной специальности)

Освоение дисциплины ведется в рамках реализации программы аспирантуры:

**Building designs, buildings and constructions / Строительные конструкции, зданий и
сооружения (англ.)**

(наименование программы аспирантуры)

2022 г.

1. GOALS OF THE DISCIPLINE / ЦЕЛЬ ОСВОЕНИЯ ДИСЦИПЛИНЫ

The purpose of mastering the discipline «Building designs, buildings and constructions: the theory of buildings and structures» is preparation for the candidate's examinations and obtaining knowledge, skills and experience in the field of construction.

2. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE / ТРЕБОВАНИЯ К РЕЗУЛЬТАТАМ ОСВОЕНИЯ ДИСЦИПЛИНЫ

The process of studying the discipline «Building designs, buildings and constructions: the theory of buildings and structures» is aimed at the formation of the following competencies:

- possession of the methodology of theoretical and experimental research in the field of construction;
- possession of the culture of scientific research in the field of construction, including the use of the latest information and communication technologies;
- 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;
- possession of linear and nonlinear mechanics of structures and structures, physical and mathematical models, analytical and numerical methods of their calculation, including the calculation of structures and structures for reliability in extreme operating conditions.

3. SCOPE OF DISCIPLINE AND TYPES OF EDUCATIONAL WORK / ОБЪЕМ ДИСЦИПЛИНЫ И ВИДЫ УЧЕБНОЙ РАБОТЫ

The total workload of the discipline «Building designs, buildings and constructions: the theory of buildings and structures» is 3 credit units.

Table 3.1. Types of educational work by periods of mastering the postgraduate program

Type of educational work	Total hours	Course			
		1	2	3	4
<i>Classroom lessons (total)</i>	60	60			
including:					
Lectures (LC)	30	30			
Laboratory work (LW)	-	-			
Practical lessons (PL)	30	30			
Independent work (total)	48	48			
<i>Control (test with assessment), total</i>	-	-			
Total labor intensity	hour	108	108		
	credits	3	3		

5. CONTENT OF THE DISCIPLINE / СОДЕРЖАНИЕ ДИСЦИПЛИНЫ

Table 5.1. The content of the discipline (module) by type of educational work

The name of the discipline section	Section content (topics)	Type of study work
Special topics in the design of metal structures	<ul style="list-style-type: none"> - Classification of buildings by structural systems. Multi-storey and high-rise buildings with a metal frame. - Composite frames: decks, beams, columns, foundations. Ensuring the spatial rigidity of frame buildings. Vertical and horizontal connections of the building. - Determination of the loads acting on the building. Methods for the analysis of structural systems. Frames of multi-storey buildings. Accounting for the plastic work of the material. - Design of light metal structures: light beams, light trusses and frames. Lightweight structural metal shells. 	LC, PL
Special topics in the design of reinforced concrete structures	<ul style="list-style-type: none"> - Construction of multi-storey industrial buildings. Purpose of the building. Sizing. Number of floors. Column grid. Main supporting structures. - Multi-storey prefabricated frame. Constructive schemes of multi-storey frames with ready-made elements. Connections of multi-storey prefabricated frames. - Multi-storey monolithic and prefabricated monolithic construction. Units of monolithic multi-storey frames. Rebar nodes. - Practical calculation of multi-storey frames. Preselection of sections of frame elements. Computer simulation of RC frames. 	LC, PL
Reliability and safety of buildings and structures	<ul style="list-style-type: none"> - Reliability as the ability of a building or structure to perform its functions. Service life of construction projects. Operating conditions of building structures. Durability of buildings as the ability of structures to maintain their properties. - Operation of buildings and structures. Maintenance of building structures. Repair and reinforcement of structures or reconstruction of a building. Technical monitoring of buildings and structures. - The probabilistic nature of the loads and mechanical properties of building materials. System security factors. Calculation of limit states. - Criteria for the reliability of buildings and structures. Application of the principle of structure analysis for the most unfavorable 	LC, PL

The name of the discipline section	Section content (topics)	Type of study work
	combination of loads. The choice of materials for structures that increase their reliability. - Adoption of design and engineering decisions that reduce the likelihood of progressive collapse. Selection of optimal technological processes for the manufacture of structures and effective methods of construction of buildings and structures.	
Design of earthquake-resistant structures.	- Occurrence and consequences of earthquakes; Seismological foundations of earthquake-resistant construction; Propagation of waves caused by earthquakes. - Determination of parameters that determine the impact of earthquakes; Methods for calculating soil interaction; Design and analysis of plastic structures to maintain performance and / or safety. - Active and passive methods for identifying structures from earthquakes; Determination of the size of soil structures for earthquakes; Examples from engineering practice.	LC, PL

6. MATERIAL AND TECHNICAL SUPPORT OF THE DISCIPLINE / МАТЕРИАЛЬНО-ТЕХНИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

Table 6.1. Logistics of discipline

Type of auditorium	Auditorium equipment	Specialized educational / laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture room	An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	
Classroom for practical training	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.	
Computer class	Computer class for conducting classes, group and individual consultations, current control and intermediate certification, equipped with personal computers (in the amount of 12 pcs), a board (screen) and technical means of multimedia presentations.	RUDN University software: Plaxis 2D Suit (Network license). Plaxis Professional (version 8) + Plaxis Dinamics Modul + PlaxFlow (version 1) - Education Registration

Type of auditorium	Auditorium equipment	Specialized educational / laboratory equipment, software and materials for mastering the discipline (if necessary)
		number 90-07-019-00261-3 MS-office corporate, Registration code: 86626883 Parent program: 86493330 Status: Active
Educational-methodical room for independent, research work of students	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.	418

* - аудитория для самостоятельной работы обучающихся указывается обязательно!

7. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF THE DISCIPLINE / УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

Main literature:

1. Yudina, AF Metallicheskie i zhelezobetonnye konstruksiy [Metal and reinforced concrete structures]. Editing: textbook for universities / A.F. Yudin. - 2nd ed., Rev. and add. - Moscow: Yurayt Publishing House, 2019 .-- 302 p. - (Series: Specialist). - ISBN 978-5-534-06927-3. - Text: electronic // EBS Yurayt [site]. - URL: <https://biblio-online.ru/bcode/434494> (date of access: 01.04.2019).

2. Krivoshapko, SN Architectural and building structures: a textbook for academic bachelor's degree / SN Krivoshapko, VV Galishnikova. - Moscow: Yurayt Publishing House, 2019 .-- 460 p. - (Series: Bachelor. Academic course). - ISBN 978-5-534-03143-0. - Access mode: HYPERLINK <https://biblio-online.ru/bcode/432798>

3. Tukhfatullin, BA Numerical methods of calculation of building structures. Finite element method: textbook. manual for academic bachelor's degree / BA Tukhfatullin. - 2nd ed., Rev. and add. - Moscow: Yurayt Publishing House, 2019 .-- 157 p. - (Series: Bachelor. Academic course). - ISBN 978-5-534-08899-1. - Access mode: HYPERLINK <https://biblio-online.ru/bcode/442338>

Additional literature:

1. Krivoshapko, SN Construction of buildings and structures: textbook for SPO / SN Krivoshapko, VV Galishnikova. - Moscow: Yurayt Publishing House, 2019 .-- 476 p. - (Series: Professional Education). - ISBN 978-5-534-02348-0. - Access mode: HYPERLINK <https://biblio-online.ru/bcode/433396>

2. Dedyukh, RI Materials science and technology of structural materials. Fusion welding technology: textbook. manual for applied baccalaureate / RI Dedyukh. - Moscow: Yurayt Publishing House, 2019 .-- 169 p. - (Series: Universities of Russia). - ISBN 978-5-534-01539-3. -

Text: electronic // EBS Yurayt [site]. - URL: <https://biblio-online.ru/bcode/433979> (date of access: 01.04.2019).

3. Yudina, AF Building structures. Editing: textbook for SPO / A.F. Yudin. - 2nd ed., Rev. and add. - Moscow: Yurayt Publishing House, 2019 .-- 302 p. - (Series: Professional Education). - ISBN 978-5-534-07027-9. - Access mode: HYPERLINK <https://biblio-online.ru/bcode/442133>

4. Shambina S.L. Structural mechanics [Text / electronic resource]: Lecture notes. / S.L. Shambina. - Electronic text data. - M.: Publishing house of RUDN, 2015 .-- 48 p. : ill. - ISBN 978-5-209-06779-5: 42.15. Access mode: http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=447028&idb=0

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/>

Methodical instructions for students on mastering the discipline (module):*

1. A course of lectures on the discipline "Building designs, buildings and constructions: the theory of buildings and structures"

2. Methodical instructions for independent work of students in the discipline "Building structures, buildings and structures"

* - все учебно-методические материалы для самостоятельной работы обучающихся размещаются в соответствии с действующим порядком на странице дисциплины в ТУИС!

8. FUND OF ASSESSMENT TOOLS FOR INTERMEDIATE CERTIFICATION OF STUDENTS IN THE DISCIPLINE (MODULE) / ОЦЕНОЧНЫЕ МАТЕРИАЛЫ И БАЛЛЬНО-РЕЙТИНГОВАЯ СИСТЕМА ОЦЕНИВАНИЯ УРОВНЯ СФОРМИРОВАННОСТИ КОМПЕТЕНЦИЙ ПО ДИСЦИПЛИНЕ

Evaluation materials and a point-rating system for assessing the development of the discipline are presented in the Appendix to this Work Program of the discipline.

* - ОМ и БРС формируются на основании требований соответствующего локального нормативного акта РУДН.

DEVELOPERS:

**Ass. Professor at the Department of
Civil engineering**



Shambina S.L.

DIRECTOR AT THE DEPARTMENT:

Department of Civil engineering



Rynkovskaya M.I.
