

# MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA

Federal State Educational Institute of Higher Education  
"Moscow Architectural Institute (State Academy)"

## ANNOTATION TO THE WORK PROGRAM OF THE DISCIPLINE (MODULE) Architectural Structures (B1.O.38)

Assigned to the department:	<b>Building Structures</b>
Educational Level:	<b>Bachelor</b>
Specialization:	<b>07.03.01 Architecture</b>
Basic professional educational program of higher education:	<b>Architecture</b>
Form of study:	<b>full-time</b>
Hours/credits:	<b>288 hrs (8 credits)</b>

The work program for a discipline (module) is based on:

1. Federal State Educational Standard for Higher Education 07.03.01 Architecture, approved by the order of the Ministry of Education and Science of Russia No 509 of 08.06.2017
  2. Curriculum for the specialization 07.03.01 Architecture, approved by the Academic Council of MARCHI. Minutes No 6-18/19 of 27.03.2019.
- The work program of the discipline (module) was approved at a department meeting. Minutes: No 5 of 02.07.2019.

Developers: Professor of the Department "Building Structures", PhD, assistant professor. L.A.Munchak;

Reviewers: Assistant professor of the department "Building Structures" V.G.Krivitskiy,  
Head of Department "Higher Mathematics and Structural Mechanics" MARCHI, PhD prof. G.M.Chentemirov

### INTRODUCTORY PART

#### 1. Goals of Mastering the Module

The purpose of the foundational module "Architectural Structures", consisting of five sections, is to form a competent understanding of the role of building structures in architecture and to teach practical methods of designing building structures when solving architectural and urban planning problems. Objectives of the discipline: - to cover the basics of the composition of the structural parts of buildings; - to explicate methods of standardization, analysis and design of load-bearing and enclosing structures in buildings and structures so that they are adequate to the architectural design and efficient in terms of costs and energy consumption.

#### As a result of mastering the discipline, the student must:

**Know:** the logic behind the development of modern building materials, structures and technologies, principles of designing architectural structures, the roles and capabilities of structures and materials in solving architectural problems, principles of operation and application of construction systems in low-rise and high-rise buildings construction, as well as in buildings with long-span structures.

**Be able to:** compare and select rational design solutions for low- and high-rise residential and public buildings and buildings with long-span structures. Effectively combine structures and materials taking into account aesthetic, operational and economic requirements. Create drawings/images of elevations, plans, cross-sections of the building. Create detailed plans of parts and components.

#### 2. The Place of the Module in the Educational Program of the Institute

##### 2.1.

Required previous disciplines:  
Architectural Materials Science;  
Architectural and construction technologies;  
Architectural Design;  
Engineering Equipment of Buildings;  
Descriptive Geometry and Engineering Drawing.

2.2. A list of subsequent academic disciplines that require knowledge, skills and abilities formed by this academic discipline:

Subsequent disciplines:

Structural Engineering

### 3. Requirements for the results of mastering the discipline (module)

The study of this discipline is aimed at developing in students the following competencies in accordance with competency achievement indicators:

GPC-3. General Professional Competencies (GPC). Able to participate in complex design project based on a systematic approach, based on current legal requirements (codes), financial resources, analysis of the situation in social, functional, environmental, technological, engineering, historical, economic and aesthetic aspects.

GPC-3.1. knows how to: Participate in the development of urban and spacial planning solutions. Participate in the preparation of presentation materials, support of project documentation at the approval stages. Use methods of modeling and harmonization of artificial habitats when developing urban and spacial planning solutions. Use the techniques for preparing presentation materials for architectural projects and techniques of presenting them.

GPC-3.2. knows: Composition of design documentation drawings, social, functional and technological, ergonomic (including taking into account the characteristics of persons with disabilities and groups of persons with limited mobility), aesthetic and economic requirements for architectural objects of various types.

PC-2 Professional Competence (PC). Able to participate in the development and design of the architectural and design section of the project documentation.

PC-2.1. knows how to: participate in justifying the choice of architectural objects (including taking into account the characteristics of persons with disabilities and groups of persons with limited mobility); - participate in the development of project documentation; carry out calculations of technical and economic indicators; use computer-aided design and automation software in architectural projects.

PC-2.2. knows: legal and regulatory requirements for architectural design; - social, urban, historical and cultural, spacial, functional and technological, constructional, compositional, artistic, ergonomic requirements for various environmental objects; composition and rules for calculating technical and economic indicators used in technical and economic calculations of design solutions; - methods and techniques of computer-aided design, basic software packages for design, creation of drawings and models.

UC-2. Universal Competence (UC). Able to determine the set of tasks within the set goal and choose the optimal ways to solve them based on current legal norms, available resources and other limitations.

UC-2.1. is able to: Participate in the analysis of the project tasks, the selection of methods and means for accomplishing them. Act in compliance with legal norms and implement anti-corruption measures.

UC-2.2. knows the requirements of the current codes and regulations for architectural design, sanitary standards, including requirements for organizing an accessible and barrier-free environment for persons with disabilities and low mobility persons. Requirements of anti-corruption legislation.

## Main Part

### 1. Module Scope and Types of Academic Work

Type of academic work	Hours	Semesters / Trimesters					
		3	4	6	7	8	
<b>Classroom work</b>	<b>174</b>	<b>68</b>	<b>34</b>	<b>18</b>	<b>36</b>	<b>18</b>	
Lectures (LEC)	48	32	0	0	16	0	
Practical lessons (PR)		0	0	0	0	0	
Work in groups (GR)	112	32	32	16	16	16	
Classroom time spent during attestations (AT)	14	4	2	2	4	2	
Self-preparation for the exam (SP)	64	32	0	0	32	0	
Independent work	50	8	2	18	13	9	
<b>Type of intermediate attestation</b>		<b>exam</b>	<b>test</b>	<b>test</b>	<b>exam</b>	<b>test</b>	
<b>Total hours:</b>	<b>288</b>	<b>108</b>	<b>36</b>	<b>36</b>	<b>81</b>	<b>27</b>	

Type of academic work	Hours	Semesters / Trimesters					
		3	4	6	7	8	
<b>Credits:</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2.25</b>	<b>0.75</b>	

1 credit = 36 academic hours.

## 2. Sub-modules, topics and types of educational activities

Se- mes- ter	Sub- mo- dule	Topic	LEC	PR	GR	AT	SP	Total hours
3	1	General problems in the design of buildings and structures.	2		2		0	4
3	1	Basics of designing the load-bearing frame of a building	3		3		1	7
3	1	Building foundations	2		2		1	5
3	1	Load-bearing and enclosing masonry walls	3		3		1	7
3	1	Ceilings of low-rise buildings	3		3		1	7
3	1	Floors	2		2		0	4
3	1	Roofing of low-rise buildings	3		3		1	7
3	1	Roofing of pitched and flat roofs	3		3		1	7
3	1	Stairs	2		2		1	5
3	1	Frame (half-timbered), stick-frame, panel walls	2		2		1	5
3	1	Load-bearing walls made of logs and horizontal beams	2		2		0	4
3	1	Elements of low-rise housing construction	3		3		0	6
3	1	Windows and doors of residential buildings	2		2	4	0	8
<b>Total in semester:</b>								<b>76</b>
4	2	Completion of the module project "Low-rise residential building"			32	2	2	36
<b>Total in semester:</b>								<b>36</b>
6	3	Completion of the module project "Long-span industrial building"			16	2	18	36
<b>Total in semester</b>								<b>36</b>
7	4	General problems in the design of multi-storey residential buildings	1		1		0	2
7	4	Load-bearing frames of multi-storey buildings. Structural systems	2		2		2	6
7	4	Concrete Bearing walls system for multi-storey buildings	2		2		2	6
7	4	Concrete Building frame system for multi-storey buildings	2		2		2	6
7	4	External panel walls	2		2		2	6
7	4	Enclosing structures of external walls	2		2		2	6
7	4	Roofs of multi-storey buildings	2		2			4
7	4	Construction of balconies, loggias, bay windows in various structural systems	2		2		2	6
7	4	Stairs of multi-storey buildings	1		1	4	1	7
<b>Total in semester:</b>								<b>49</b>
8	5	Completion of the module project "Multi-storey Residential Building"			16	2	9	27
<b>Total in semester:</b>								<b>27</b>
<b>Total:</b>								<b>224</b>

The Fund of Assessment Tools is a mandatory section of the Work Program of the Discipline (WPD) (developed as a separate document).

Note: The Fund of Assessment Tools - a set of assessment materials as well as a description of forms and procedures designed to determine the level of student achievement of established learning outcomes.