

REPUBLIC OF UZBEKISTAN
MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS
FERGANA STATE TECHNICAL UNIVERSITY

Architecture of industrial and civil buildings
MODULE HANDBOOK

Field of knowledge:	700000	- Engineering, manufacturing and construction
Field of education:	730 000	- Architecture and construction
Education program (Major):	60730300	- Civil engineering

Module title	<i>Architecture of industrial and civil buildings</i>
Code (if available)	<i>AICB1M56, AICB2M66, AICB3M76</i>
Semester(s) of module teaching	<i>5, 6, 7</i>
Responsible for the module	<i>Nabiyev Mo'minjon - Associate professor, department of civil engineering Qodirov G'iyozjon Mirzajonovich - Senior lecturer, department of civil engineering,</i>
Language of instruction	<i>Uzbek, Russian</i>
Connection to the curriculum	<i>Main</i>
Teaching methods	<i>Lectures, practical classes, independent study</i>
Study load (including classroom and independent study hours)	<i>Total hours: 540 hours Auditorium hours: 216 hours Lectures: 82 hours Practical classes: 134 hours Independent study: 324 hours</i>
Credit units	<i>18</i>
Required and recommended prior knowledge for studying the module	<i>Engineering and computer graphics, computer-aided building design (AutoCAD)</i>
Module objectives/intended learning outcomes	Module Objective: <i>The objective of this course is to develop students' knowledge, skills, and competencies in the fundamentals of designing industrial and civil buildings, understanding their structural elements, mastering the physical and technical principles of building design, and grasping the basics of urban planning in accordance with their field of specialization.</i> Course Task – <i>The course aims to teach students how to use architectural building designs in the construction and design process, as well as to equip them with the ability to create and apply architectural design documents for buildings and structures in construction and engineering practice. Knowledge, skills, and competencies expected of students. Students are expected to:</i> – <i>Understand the spatial-planning and structural design solutions of buildings, as well as the functions and characteristics of structural elements and components. Since graduates in this field must possess a foundational understanding of architectural design principles and construction theories, this knowledge is essential.</i> – <i>Acquire knowledge in the following areas: fundamentals of designing civil buildings and structures and their structural elements; the physical and technical foundations of building design; principles of urban planning; and approaches to the restoration and reconstruction of buildings.</i> – <i>Be capable of using architectural design documentation in the construction and erection of buildings, and of creating and applying architectural design solutions for buildings and structures in construction and engineering practice.</i> – <i>Be proficient in the use of computer graphics and modern information technologies. The course involves extensive use of building models and mock-ups. Instructional materials and demonstrations are delivered through computer-based tools,</i>

	and students are expected to utilize electronic resources to deepen their independent learning of the subject.
Contents	Module 1. Residential buildings Purpose and significance of the subject “Architecture of Industrial and Civil Buildings.” General information about buildings. Basic requirements for buildings. Unified Module System (UMS). Civil buildings and their structures. Main components and structural schemes of civil buildings. Floors and foundations. Module 2. Structural elements of residential buildings Structural elements of walls. Individual supports, girders, and partition walls. Floors: classification, features, and structures. Combined (monolithic) roofs and their requirements. Attic roofs: ventilated and non-ventilated types. Rainwater drainage from roofs. Module 3. Components of residential buildings Windows and doors in buildings, their classification. Balconies, verandas, and terraces. Multi-story residential buildings constructed from stone materials, small and large blocks. Volume-block buildings: types, structural schemes, and solutions. Monolithic reinforced concrete buildings. Requirements and structural solutions for buildings constructed in seismically active, dry and hot climate zones. Module 4. Public buildings General information about public buildings. Introduction to urban planning norms and regulations for designing public buildings and structures. Spatial-planning and compositional solutions of public buildings. Functional foundations and classification in public building design. Volume schemes and functional-technological schemes of public buildings. Module 5. Main spatial elements of public buildings Entrances, main rooms, utility, and service room groups. Horizontal and vertical circulation. Natural and climatic factors affecting public building design. Light, sound, and thermal comfort. Provision of lighting. Indoor microclimate. Engineering systems in public buildings. Visualization of functional processes within buildings. Human flow, buildings constructed from large blocks: types and structural schemes. Module 6. Technical Requirements for Frame and Non-Frame Buildings Building stability and spatial rigidity. Structural solutions for public buildings. Frame buildings and their structural components. Connections of frame elements and structural joints. Static schemes of frame buildings: rigid-frame, braced-frame, and braced schemes. Stiffening diaphragm and core. Large-span public buildings. Roof structures made of reinforced concrete and metal. Thin-walled spatial structures. Cylindrical shells, domed and arched public buildings. Structural requirements and solutions for buildings in seismic, dry, and hot regions. Module 7. General information on industrial buildings Classification of industrial buildings. Unification and standardization of industrial buildings and structures. Industrialization and typification of industrial building

	components. Influence of technological production schemes on the spatial-planning solutions of industrial buildings. Main requirements for industrial buildings. Interior and exterior design of industrial production buildings. Trusses of single-story industrial buildings. Hoisting and transportation equipment used in industrial buildings. General information on foundations in industrial buildings. Precast and monolithic foundations. Types of foundations used in difficult soil conditions. Foundation beams for industrial buildings. Module 8. Columns used in industrial buildings Types of columns used in industrial buildings. Framework columns and ties between them. Reinforced concrete columns used in multi-story industrial buildings. Bracing beams in industrial buildings. Crane beams. Frames of multi-story industrial buildings. General information on walls of industrial buildings. Walls made of corrugated sheets and asbestos-cement panels. Non-load-bearing walls. Brick, small and large block walls in industrial buildings. Module 9. Walls made of reinforced and lightweight concrete panels Windows of industrial buildings. Roof structures of industrial buildings. Beams and trusses used in industrial roofs. Roofing and intermediate floor slabs. Roofing layers of industrial buildings. Drainage systems for atmospheric water. Skylights and ventilation lanterns used in industrial buildings. Timber roof beams and trusses. Additional elements of industrial buildings. Site planning and landscaping of enterprise premises.
Forms of assessment	Oral assessments, presentations, written assignments, practical tasks, and final examinations
Requirements for study and assessment	To successfully complete the module, the student must attend classes and obtain the minimum required scores in current, midterm, and final assessments.
Bibliography	1. M. Riley, A. Cotgrave. Construction Technology 1: House Construction. Palgrave Macmillan, 2018. 2. Goncharova, N.I. Architecture of Buildings and Structures. Textbook. Fergana: "Classik" Publishing, 2022. 428 pages. 3. Goncharova, N.I., Abobakirova, Z.A., Davlyatov, Sh.M. Architecture of Buildings and Structures. Textbook. Fergana, 2019. 4. Qodirova, S.M. To'xtasinovna. Design of Residential and Public Buildings. Textbook. Tashkent, 2020. 5. Miralimov, M.M. Architecture of Buildings and Structures. Study Guide. Tashkent, 2019. 6. Miralimov, M.M. Architecture of Industrial Buildings. Tashkent, 2019. 7. Nabiyev, M. Architecture of Civil and Industrial Buildings. Study Guide. Fergana: "Classik", 2020. 184 pages. 8. To'ychiyev, N.J. Structural Elements of Buildings and Structures. Textbook. Tashkent: "Voriz Nashriyoti" LLC, 2010. 240 pages. 9. Vakhitov, M.M., Mirzayev, Sh.R. Architecture Parts I, II,

	<i>III. Textbook. Tashkent: "Tafakkur" Publishing, 2010. 255 pages.</i> <i>10. Hakimov, G'.A. Architecture (Architecture of Civil Buildings). Study Guide. Tashkent, 2021. 266 pages.</i> <i>11. Maxkamov, Y.M., Akhmedov, J.D. Architectural Structures. Textbook. Fergana, 2021. 242 pages.</i> <i>12. Miralimov, M.M. Architecture of Industrial and Civil Buildings. Study Guide. Tashkent, 2018.</i>
Reviewers	<i>M.M.Baxromov - Associate professor, department of civil engineering, Fergana state technical university;</i> <i>M.Ashurov – Structural engineer, Fergana design-construction and renovation LLC</i>