

Reconstruction of buildings and structures

MODULE HANDBOOK

Field of knowledge:	700000	Engineering, processing and construction industries
Field of education:	730 000	Arcitecture and construction
Educational Program:	60730300	Civil Engineering

Module title	<i>Reconstruction of buildings and structures</i>
Code, (if applicable)	<i>RBST84</i>
Semester(s) of module teaching	<i>8</i>
Responsible for the module	<i>Mirzababayeva Sakhiba Mirzaakbarovna, Department of Civil Engineering, Associate Professor</i>
Language of instruction	<i>Uzbek</i>
Connection to the curriculum	<i>Elective</i>
Teaching methods	<i>Lecture, practical training, independent learning.</i>
Study load (incl. contact hours, self-study hours)	<i>Total hours: 120 hour Auditorium hours: 48 hour lecture – 14 hour, practical training – 36 hour, independent learning 72 hour.</i>
Credit units	<i>4</i>
Required and recommended prior knowledge for studying the module	<i>Building structures, building mechanics, soil mechanics, Construction organization and planning, Seismic resistance of buildings and structures</i>
Module objectives/intended learning outcomes	<i>The purpose of the module: To form in students the appropriate knowledge, skills and qualifications in the field of construction management, reconstruction and modernization, and improvement of urban areas using model structures in the reconstruction of buildings and structures.</i> <i>The subject is to familiarize and train students in the methods of drawing up reconstruction projects for construction sites, residential and municipal enterprises, taking into account the volumetric and planning parameters, structural features and technical condition of buildings, obtaining information for the design of reconstruction works, determining the degree of wear and tear based on the service life of buildings, and conducting inspection works on buildings and structures. The following requirements are imposed on the knowledge, skills and qualifications of students in the discipline.</i> <i>The student:</i> <i>• within the framework of the issues to be addressed in the process of mastering the academic discipline of reconstruction of buildings and structures, the bachelor:</i> <i>• has knowledge and ideas about the activities related to the reconstruction and modernization of buildings and structures, their characteristics, methods of inspection and diagnostics of the condition of buildings and structures, volumetric and planning parameters of buildings, design solutions and economic criteria for the reconstruction of buildings and structures;</i> <i>• has the skills to use modern building materials, construction technologies, machines and mechanisms in the design of the reconstruction of residential, civil, industrial buildings and structures;</i> <i>• Must have the skills to pre-evaluate building reconstruction work, inspect the condition of buildings and structures, determine strength and deformation properties, assess the deformation of certain structures, inspect and, if necessary, strengthen foundations and foundations, determine economic criteria for design solutions in the reconstruction of buildings and structures, calculate the strengthening of load-bearing</i>

	<i>structures, and use computer programs.</i>
Content	Module 1. Urban reconstruction. Modernization of housing. Comfort of buildings Urban reconstruction. Description of the planning of old residential buildings. Architectural planning requirements for the reconstruction of buildings. Reconstruction of existing building quarters in the central part of the city. Technical condition of the housing stock to be reconstructed. Modernization of housing. Modernization of engineering systems. Enclosing structures of housing. Increasing the heat resistance of buildings to ensure the comfort of buildings. Increasing the sound resistance of buildings. Basic principles of protecting housing from sunlight. Service life of buildings and their actual deterioration. Preliminary assessment of housing reconstruction works and determination of the feasibility of building reconstruction. Module 2. Inspection of buildings and structures. Types of diagnostics of buildings and structures. Determination of the strength of structural materials using non-destructive methods Inspection of buildings and structures. Organization of work. Inspection and preparation of buildings for design. Inspection work. Methods of checking the condition of buildings and structures. General or preliminary inspection. Detailed inspection. Equipment for inspection work. Equipment used to determine strength and deformation properties. Technical safety in the diagnosis of buildings. Types of diagnostics of buildings and structures. Determination of deformation of buildings and structures. Assessment of deformation of individual structures. Deformation of structures. Determination of the characteristics of crack formation in building elements. Module 3. Determination of the strength of structural materials using non-destructive methods Obtaining information for the design of reconstruction works Determination of the strength of structural materials using non-destructive methods. Mechanical methods. Physical methods. Determination of the degree of corrosion and temperature damage of building and structure elements. Actual testing. Determination of the condition of the structure. Classification of structural elements by the degree of wear. Inspection of foundations and foundations. Obtaining information for the design of reconstruction works. Engineering surveys at the site of the object being reconstructed. Engineering geological surveys. Hydrogeological surveys. Resistance to wear of concrete. Determination of the resistance of concrete to the effects of the planned operating environment. Resistance of concrete to frost. Determination of the resistance of concrete to atmospheric influences. Determination of the actual dynamic characteristics of structures. Loads and impacts. Specificity of the reconstruction of industrial buildings and structures. Criterion of the cost-effectiveness of the design solution for the reconstruction of buildings and structures. Module 4. Methods of diagnosis (diagnostics) of concrete and reinforced concrete structures. Methods of diagnosis (diagnostics) of concrete and reinforced

	concrete structures. Inspection of stone and reinforced concrete structures. Diagnostic features of metal structures. Defectoscopy of wooden structures. Drawing up a conclusion on the technical condition of buildings and structures. Estimation of the cost of reconstruction work and determining the need for these works. Module 5. General construction measures. Strengthening the foundations. Replacement of load-bearing structures. Design of strengthening of reinforced concrete and stone structures General construction measures. Strengthening the foundations. Determination and restoration of the state of waterproofing and moisture. Improvement of the external construction of buildings. Replacement and strengthening of the roof, partition wall and other structural elements. Elimination of structural defects. Replacement of load-bearing structures. Structures for replacing rafters. Lightweight enclosing structures. Use of monolithic cast reinforced concrete. Non-removable elements. Replacement of stairs and balconies. Design of reinforcement of reinforced concrete and stone structures. Basic principles of reinforcement design. Strengthening foundations. Module 6. Improvement and strengthening of stone structures. Reconstruction of public buildings. Reconstruction of industrial enterprises Purpose and issues of reconstruction of industrial enterprises. Durability and deterioration of industrial enterprises. The need for reconstruction of industrial enterprises. The main factors influencing the formation of architectural solutions.
Forms of assessment	oral, presentation, written work, practical assignments, and final exams.
Requirements for study and assessment	To successfully complete the module, the student must attend classes and achieve the minimum scores set in the current, midterm, and final assessments..
Bibliography	1. S.M.Mirzababayeva "Reconstruction of buildings and structures". Fergana, 2024. - 252 p. ISBN:978-9910-783-62-3 @ "Classic"- 2024 2. D.U.Isamukhamedova "Reconstruction of cities and villages" textbook. Tashkent "Economy - Finance" 2018. 232p. 3. Mirolimov M.M. "Repair, reconstruction of buildings and structures" textbook. T.2022y. 166p. 4. ASCE Standard AS7CE/SEI 7-05. Minimum Design Loads for Buildings and other Structures. Published by the American Society of Civil Engineers. 2005. - pp.419.
Reviewers	Z.A.Abobakirova - Fergana State Technical University, Associate Professor (PhD) of the Department of "Construction Engineering"; O.J.Rakhmonov - Head of the Territorial Inspection for Construction and Housing and Communal Services of the Fergana Region, Head of the Construction Testing Laboratory and Department for the Study of the Technical Condition of Buildings and Structures;