

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

REINFORCED CONCRETE AND STONE STRUCTURES 1, 2
MODULE HANDBOOK

Field of knowledge: 700000 – Engineering, processing and construction specialities

Educational field: 730000 – Architecture and construction

Education program: 60730300 – Civil engineering

Module title	<i>Reinforced concrete and stone structures 1, 2</i>
Code (if available)	RCSS1M76, RCSS2M84
Semester(s) of module teaching	7, 8
Responsible for the module	<i>Bakhromov Makhmudkhon Mamathanovich, Department of Civil Engineering, Associate Professor Sozhjonov Foziljon Sodikjonovich, Department of Civil Engineering, Assistant Rakhimov Rasuljon Ravshanbekovich, Department of Civil Engineering, Assistant</i>
Language of instruction	<i>Uzbek, Russian</i>
Connection to the curriculum	<i>Compulsory</i>
Teaching methods	<i>lectures, practical classes, laboratory work, independent work</i>
Study load (including classroom and independent study hours)	<i>Total hours: 300 hours Auditorium hours: 120 hours lectures — 48 hours, practical classes — 60 hours, laboratory work — 12 hours, independent work — 180 hours</i>
Credit units	10
Required and recommended prior knowledge for studying the module	<i>Building materials, architecture of buildings and structures, strength of materials, construction mechanics</i>
Module objectives/intended learning outcomes	Module Objective: <i>The objective of this module is to develop students' theoretical and practical knowledge regarding the fundamentals of designing and calculating civil buildings and structures, as well as their structural elements.</i> Learning Outcomes: <i>Upon completion of this course, students are expected to:</i> - <i>Understand the fundamentals of limit state calculations for reinforced concrete and masonry structures;</i> - <i>Understand loads and impacts;</i> - <i>Know reliability coefficients;</i> - <i>Know the standard and design strength of concrete and reinforcement;</i> - <i>Be able to calculate flexural reinforced concrete elements for normal and inclined sections;</i> - <i>Know the basics of limit state calculations for tension and compression elements, for both the first and second groups of limit states;</i> - <i>Understand the structures of buildings and facilities, including roof and floor structures;</i> - <i>Be able to calculate and design foundations;</i> - <i>Be familiar with the design of precast and cast-in-place reinforced concrete frame buildings;</i> - <i>Understand the structural solution of a single-story industrial building;</i> <i>Be able to develop calculation schemes and possess the basic skills required to perform structural calculations.</i>
Content	Module 1. Fundamentals of Designing Reinforced Concrete and Masonry Structures <i>Procedure for calculating and designing reinforced concrete structures. Calculation of reinforced concrete structures by limit states. Loads and impacts. Physical and mechanical properties of concrete. Physical and mechanical properties of reinforcement.</i>

	<i>Standard and design resistances of concrete and reinforcement. The three stages of the stress-strain state in reinforced concrete structures.</i> Module 2. Fundamentals of Calculating Reinforced Concrete and Masonry Structures <i>Calculation of flexural reinforced concrete elements for strength in normal sections. Calculation of flexural reinforced concrete elements for strength in inclined sections. Specific features of designing compressed reinforced concrete elements. Strength calculation of eccentrically compressed reinforced concrete elements. Design and calculation of tensioned reinforced concrete elements.</i> Module 3. Prestressed Elements, Calculations of Reinforced Concrete Elements by Second Group Limit States <i>Prestressed reinforced concrete structures. Crack resistance calculation of reinforced concrete elements. Deformation of flexural reinforced concrete elements.</i> Module 4. Reinforced Concrete Floor Slabs <i>Solid reinforced concrete floor slabs. Solid ribbed floor slabs. Solid ribbed slabs supported along the contour.</i> Module 5. Linear and Spatial Covering Elements <i>Reinforced concrete linear slabs. Spatial slabs.</i> Module 6. Reinforced Concrete Foundations <i>Ground and foundations. Shallow foundations on natural soil. Foundations constructed in special conditions. Principles of designing, calculating, and reinforcing foundations. Solid foundations.</i> Module 7. Reinforced Concrete Frame Buildings <i>Design of structures for single-story frame buildings. Design of structures for multi-story buildings. Seismic resistance of buildings.</i> Module 8. Masonry and Brick Structures <i>Masonry and brick structures. Reinforced masonry structures. Durability of brick-walled and complex-structure buildings constructed in seismic zones.</i>
Forms of assessment	<i>Oral examination, presentations, written assignments, practical tasks, laboratory work, and final examinations.</i>
Requirements for study and assessment	<i>To successfully complete the module, students must attend classes and achieve the minimum required scores in current, midterm, and final assessments.</i>
Bibliography	1. S.A. Yusufkhodjaev, "Construction Structures", Textbook, Tashkent, 2019 2. V.F. Usmanov, "Reinforced Concrete and Masonry Structures", Textbook, SAHHOF, 2022, 552 pages 3. Sh. Nizomov, A. Mirzaakhmedov, M. Bakhramov, "Problems and Examples on the Calculation of Reinforced Concrete

	<i>Structures”, Study Guide, Fergana, 2024</i> 4. <i>X.A. Akramov, “Design of Reinforced Concrete Structures”, Textbook, Tashkent: Book Trade, 2022, 352 pages.</i>
Reviewers	<i>A. Dosmatov – Associate Professor, Department of Civil Engineering, Fergana State Technical University, PhD in Technical Sciences</i> <i>O. Rakhmonov – Head of Laboratory, Regional Inspectorate for Construction Control, Fergana Region</i>