

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

BUILDING STRUCTURES
MODULE HANDBOOK

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

Educational field: 730000 – Architecture and construction

Education program: 70730300 – Civil engineering

Module title	<i>Building Structures</i>
Code (if available)	CST66
Semester(s) of module teaching	6
Responsible for the module	<i>Bakhramov Makhmud Mamathanovich, Department of Civil Engineering, Candidate of Technical Sciences, Associate Professor Rakhimov Rasuljon, Department of Civil Engineering, Assistant</i>
Language of instruction	<i>Uzbek, Russian</i>
Connection to the curriculum	<i>Elective</i>
Teaching methods	<i>Lectures, practical classes, laboratory classes, independent work.</i>
Study load (including classroom and independent study hours)	<i>Total number of hours: 180 hours Auditorium hours: 72 hours lectures — 30 hours, practical classes — 42 hours, independent work — 108 hours</i>
Credit units	6
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 course is to provide students with theoretical and practical knowledge regarding the fundamentals of designing and calculating civil buildings and structures, as well as their structural elements.</i> <i>The main task of the course is to teach students how to use building design documentation in construction practice and to find economically efficient solutions for reinforced concrete structures of buildings and structures.</i> Learning outcomes: <i>Upon completion of the course, students are expected to:</i> <i>Understand the basic principles of structural analysis using the limit state method;</i> <i>Have an understanding of the main physical and mechanical properties of construction structures;</i> <i>Know the theoretical foundations of structural design and how to perform calculations using the limit state method;</i> <i>Understand the fundamentals of how structural elements behave under load;</i> <i>Be able to perform structural calculations and design in accordance with regulatory documents and standards, and apply them in practice;</i> <i>Select volumetric planning and structural solutions for buildings and structures, taking into account the climate, industrial base, and other local conditions of the construction region;</i> <i>Possess skills in using modern technical equipment and computational tools for structural analysis;</i> <i>Have an understanding of the classification of buildings and structures in industrial and civil construction, and their main design schemes;</i> <i>Know the main structural elements of buildings and</i>

	structures and their functional roles; • Be skilled in using regulatory documents for the calculation and design of construction structures.
Content	Module 1. Procedures for Calculating and Designing Structures Calculation of construction structures by limit state methods. Loads and impacts. General information about metal structures. Main properties of steels used in metal structures. Basic properties of steel. Behavior of steel under static loading. General information about steel product range. Module 2. Fundamentals of Metal Structure Calculations Connections in metal structures. Design and calculation of metal beams. Design and calculation of metal columns. Design and calculation of metal trusses. Module 3. General Information on Timber Structures Fundamentals of timber structure calculations. Connections in timber structures. Timber partition structures, beams, frames, arches, and trusses. Module 4. General Information on Reinforced Concrete Structures Physical and mechanical properties of concrete. Physical and mechanical properties of reinforcement. Standard and design resistance of concrete and reinforcement. Three stages of the stress-strain state in reinforced concrete structures. Prestressed reinforced concrete structures. Specific features of designing flexural reinforced concrete elements. Module 5. Fundamentals of Reinforced Concrete Structure Calculations Calculation of flexural 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. Calculation of compressed reinforced concrete elements for strength. Design and calculation of tensioned reinforced concrete elements. Module 6. Stone and Brick Structures. Reinforced Masonry Structures Distinctive structural properties of reinforced masonry structures. Fundamentals of calculations for reinforced masonry structures. Calculation of mesh-reinforced elements. Foundations and substructures. Fundamentals of designing and calculating foundations and substructures. Calculation of bearing capacity of substructures. Types of foundations. Shallow foundations on natural soil. Foundations constructed under special conditions.
Forms of assessment	Oral, presentation, written assignments, practical tasks, laboratory work, and final examinations.
Requirements for study and assessment	To successfully complete the module, students must attend classes and achieve the minimum required scores in current,

	<i>midterm, and final assessments.</i>
Bibliography	1. A.L. Tabibov, O.S. Kasimov, D.Sh. Saipova, "Construction Structures": Study Guide. C. Kholpon NMIL1, 2019. – 200 pages. 2. S.M. Mirzababayeva, "Timber Structures", Textbook, Fergana: Glebe EDIT, ISBN: 978-620-0-64030-7. Publishing permit №388-150, 2022. 3. Y.M. Maxkamov, S.M. Mirzababayeva, "Timber Structures", Study Guide, Fergana: Classic, ISBN: 978-9943-7300-5-3. Publishing permit №237-700, 2021. 4. V.S. Fyodorov, Ya.I. Shvidko, V.E. Levitsky, "Construction Structures": Textbook – Moscow: KNORUS, 2018. – 332 pages. 5. K.Q. Shukurova, "Metal Structures", Textbook – Tashkent: TAQI, 2019. – 305 pages. 6. T.S. Yakimchik, "Reinforced Concrete Structures", Study Guide; Ministry of Transport and Communications of the Republic of Belarus, Belarusian State University of Transport – Gomel: BelGUT, 2021. – 39 pages. 7. Z.Sh. Khodjaeva, "Reinforced Concrete and Stone Structures", Study Guide. Tashkent, 2020, 173 pages. 8. K.Q. Shukurova, "Metal Structures (Problem Book)", Study Guide, "Tibbiyot Nashriyoti Matbaa Uyi" LLC. Tashkent, 2022. – 208 pages. 9. V.F. Usmanov, "Reinforced Concrete and Stone Structures", Textbook, SAHHOF, 2022, 552 pages.
Reviewers	A. Dosmatov – Associate Professor, Department of Civil Engineering, Fergana State Technical University, PhD in Technical Sciences O. Rakhmonov – Head of the Laboratory, Regional Inspectorate for Construction Control, Fergana Region