

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

METAL STRUCTURES

MODULE HANDBOOK

Field of knowledge: 700000 - Engineering and construction industries

Field of Education: 730 000 - Architecture and construction

Educational program: 60730300 - Civil Engineering

Module title	<i>Metal structures</i>
Code (if available)	<i>MST76</i>
Semester(s) of module teaching	<i>7</i>
Responsible for the module	<i>Bakhromov Makhmudkhon Mamatkhanovich, docent, Department of Civil Engineering Solijonov Foziljon Sodiqjon ogli, Assistant, Department of Civil Engineering Rakhimov Rasuljon Ravshanbek ogli, Assistant, Department of Civil Engineering</i>
Language of instruction	<i>Uzbek, Russian</i>
Connection to the curriculum	<i>Elective</i>
Teaching methods	<i>Lectures, practical training, independent study</i>
Study load (including classroom and independent study hours)	<i>Total hours: 180 hours Auditorium hours: 72 hours Lectures – 22 hours, practical training – 50 hours Independent study – 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, Structural Mechanics</i>
Module objectives/intended learning outcomes	Module Objective: <i>To develop students' theoretical and practical knowledge in the fundamentals of design and calculation of residential buildings and structures, as well as their structural elements.</i> <i>The course sets the following requirements for students' knowledge, skills, and competencies. The student must:</i> <i>-understand the basics of structural calculation based on ultimate limit states;</i> <i>-know the types of loads and effects;</i> <i>-be familiar with reliability coefficients;</i> <i>-understand the design resistance of metal;</i> <i>-know the fundamentals of calculating elements subjected to tension and compression according to the first and second groups of ultimate limit states;</i> <i>-be familiar with the structural components of buildings and structures;</i> <i>-understand roofing and floor structures;</i> <i>-possess basic skills in the structural design, creation of calculation schemes, and calculation of a single-story industrial building.</i>
Content	Module 1. Fundamentals of Design of Metal Structures <i>General information about metal structures, their distinctive characteristics, and fields of application. Physical properties of materials used in metal structures. Fundamentals, objectives, and tasks of designing metal structures. Loads and effects acting on metal structures. Mechanical properties of materials used in metal structures. Behavior of steel under static loading.</i> Module 2. Fundamentals of Calculation of Metal Structures

	<i>Calculation of metal structures according to the ultimate limit states method. Calculation of bending elements. Calculation of centrally tensioned elements. Calculation of centrally compressed elements. Basic characteristics of standardized profiles.</i> Module 3. Joints of Metal Structures <i>Brief overview of welding methods and their types. Calculation of welded joints. Various types of welded joints and their connections, and their calculation. Bolt and rivet joints and their types. Calculation and design of rivet joints. Calculation and design of bolt joints.</i> Module 4. Beam Structures <i>Information about metal beam structures. Procedure for calculation of rolled beams. Calculation of beams made from individual elements.</i> Module 5. Compression Members <i>Procedure for calculation of centrally compressed columns. Design and calculation of column heads and bases.</i> Module 6. Calculation of Trusses <i>General information about metal trusses and types of metal trusses. Calculation of trusses. Determination and calculation of truss cross-sections.</i> Module 7. Design of Industrial Buildings <i>Fundamentals of industrial building design and main design requirements. Calculation of transverse frames. Calculation of frame columns. Calculation of the top and bottom parts of columns.</i>
Forms of assessment	<i>Oral exams, presentations, written assignments, practical tasks, and final examinations..</i>
Requirements for study and assessment	<i>To successfully complete the module, students must attend classes and score at least the minimum required points on current, midterm, and final assessments.</i>
Bibliography	1. Saydullayev Q.A., Shukurov K.Q. <i>Metal Structures. Textbook.</i> Tashkent: "Fan va texnologiya", 2010. 2. Yusufkhujayev S.A. <i>Construction Structures. Textbook.</i> Noshir, Tashkent, 2019. 374 p. 3. A.L. Tabibov et al. <i>Construction Structures. Study guide.</i> Tashkent: "Chulpon", 2019. 200 p. 4. Alan Williams. <i>Steel Structures Design: ASD/LRFD.</i> 1st Ed. London: "McGraw-Hill", 2018. 546 p.
Reviewers	<i>A. Dosmatov docent, Department of Civil Engineering, Fergana State Technical University, PhD in Technical Sciences</i> <i>O. Rakhmonov – Head of Laboratory, Regional Inspection for Construction Control, Fergana Region</i>