REPUBLIC OF UZBEKISTAN

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS

FERGANA STATE TECHNICAL UNIVERSITY

BIM Technologies

MODULE HANDBOOK

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

Fergana 2025

Module title	*BIM Technologies*
Code (if available)	*BIMTT7676*
Semester(s) of module teaching	*7*
Responsible for the module	*Abduraxmonov Abduxoliq Abduxodi, Senior lecturer, department of civil engineering*
Language of instruction	*Uzbek*
Connection to the curriculum	*Elective*
Teaching methods	*Practical training*
Study load (including classroom and independent study hours)	*Total hours: 180 hours* *Auditorium hours: 72 hours, including:* *Practical training – 72 hours* *Independent work: 108 hours*
Credit units	*6*
Required and recommended prior knowledge for studying the module	*Automation in building and structural design, computer technologies in structural design, structural design, seismic resistance of buildings and structures, structural mechanics, theoretical mechanics, and soil mechanics.*
Module objectives/intended learning outcomes	***Module Objective**: The objective of this module is to equip students with in-depth theoretical knowledge and practical skills in the design, structural analysis, and modeling of buildings and structures using modern BIM (Building Information Modeling) technologies such as Autodesk Revit and Tekla Structures.* *Through this course, students will become familiar with automated methods based on information technologies for structural design, and gain the ability to apply these tools in real-world practice, including the preparation of construction documentation and the development of three-dimensional (3D) models.* *This subject integrates principles of computer-aided design (CAD), BIM-based modeling, geometric drawing, computer science, structural mechanics, and building structures, and is built on the convergence of engineering and information technologies.* *Upon successful completion of the course, **students** are expected to:* – *Master the fundamentals of BIM technologies, including the interface, capabilities, modeling tools, and project management environment of Revit and Tekla software;* – *Be able to create architectural, structural, and engineering components in Revit, as well as model, detail, and prepare drawings for steel and reinforced concrete structures in Tekla Structures;* – *Apply modern methods of structural calculations using digital tools: selecting appropriate cross-sections, performing reinforcement calculations, and evaluating structures based on first and second limit states;* – *Automatically generate project documentation: create plans, sections, elevations, 3D views, and specifications based on BIM*

	models, and perform automated synchronization and coordination of design changes within the models; – *Work with scientific and technical literature: study and analyze design and structural engineering literature, summarize findings, and present the information in the form of reports, presentations, or analytical conclusions.*
Content	***Module 1: Autodesk Revit Software*** *Introduction to Autodesk Revit software* *Revit interface overview* *Setting up the main workspace* *Architectural tab, Structural tab* *Menu bar, Modify tab, and basic tools* ***Module 2: Designing with Autodesk Revit*** *Elevations, floor plans, 3D views, and sections* *Stair design in Autodesk Revit* *Designing reinforced concrete walls* *Working with windows: editing and replacing types* *Designing a multi-storey frame building using Autodesk Revit* ***Module 3: Tekla Structures Software*** *Introduction to Tekla Structures* *General overview of the software* *Interface: menu bar, toolbar, navigation tools* *Workspace configuration and project file setup* *Model environments: Modeling, Drawings, Manage, Steel, Concrete, Edit, etc.* *Basic commands: select, place, move, copy, dimension, delete* ***Module 4: Designing Precast and Cast-in-Place Reinforced Concrete Structures in Tekla Structures*** *Modeling concrete columns and beams* *Working with cast-in-place and precast slabs and walls* *Designing reinforced concrete stairs* *Placement of reinforcement using Rebar Tools* *Automatic reinforcement features* ***Module 5: Modeling Steel Structures in Tekla Structures*** *Designing steel frames, connections, gussets, and nodes* *Working with bolts, welds, plates, and other connection elements* *Using the built-in steel profile catalog* ***Module 6: Creating a Multi-Storey Frame Building Model in Tekla Structures*** *Organizing structure by floors* *Setting up project coordinates* *Modeling external and internal load-bearing elements* *Viewing the 3D model, navigating the interface, and preparing for analysis*
Forms of assessment	*oral assessments, presentations, written assignments, practical tasks and final examinations.*
Requirements for study and assessment	*successful completion of the module requires active class participation and achieving the minimum passing scores in ongoing (current), midterm, and final evaluations, in accordance with the course assessment criteria.*
Bibliography	1. *Yusufkhojayev S. A. Construction Structures. Textbook. Tashkent, 2019.* 2. *V. F. Usmonov. Reinforced Concrete and Masonry Structures.*

	Textbook. Sahhof Publishing House, 2022, 552 pages. 3. *O.A. Kovalchuk, A.V. Kolesnikov, E.M. Rusanova, R.N. Suvorov. Introduction to the LIRA 10.4 Software Package: Study Guide. Moscow, 2015, 158 pages.* 4. *Yu.N. Pchel'nikova, I.A. Kurokhtina. LIRA Software Package for Structural Analysis and Design: Basic Theoretical and Computational Principles. Study Guide. Karaganda State Technical University. Karaganda: Publishing House of KarGTU, 2015, 84 pages.*
Reviewers	*A.T.Jo'raboyev - PhD, senior lecturer, department of architecture, Fergana state technical university;* *B.O.Egamberdiyev – Head of the educational and scientific laboratory "Assessment of seismic resistance of building structures"*