

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

Water supply and sewerage systems

MODULE HANDBOOK

Field of knowledge: 700000 – Production and technical field

Educational field: 730000 – Architecture and construction

Education program: 60730300 – Civil engineering

Module title	<i>Water Supply and Sewerage Systems</i>
Code (if available)	WSST56
Semester(s) of module teaching	5
Responsible for the module	<i>Tolipov Muazfar Bakhromovich, Department of Engineering Communications Construction, Assistant Khusanov Nurmuhammad, Department of Engineering Communications Construction, Senior Lecturer</i>
Language of instruction	<i>Uzbek</i>
Connection to the curriculum	<i>Compulsory</i>
Teaching methods	<i>Lectures, practical classes, independent study</i>
Study load (including classroom and independent study hours)	<i>Total hours: 180 hours Auditorium hours: 72 hours Lectures – 30 hours, practical classes – 42 hours, independent study – 108 hours</i>
Credit units	6
Required and recommended prior knowledge for studying the module	<i>Physics, advanced mathematics, chemistry, hydraulics</i>
Module objectives/intended learning outcomes	Module objective: <i>Water supply and sewerage systems play an important role in urban management. The module aims to identify and implement optimal solutions for the design of engineering communication systems for territories. An important task is to ensure the supply of clean drinking water in sufficient quantities and at the required pressure. The course 'Water Supply and Sewerage Systems' covers the implementation of the latest scientific and technical achievements in the field of water supply, which are necessary to improve the efficiency of engineering communication systems. Requirements for students' knowledge, skills and abilities in the discipline:</i> <i>The student must:</i> <i>Have an understanding of the selection of water supply sources in design, the composition and properties of water, sewerage systems, the selection of treatment facilities, the provision of clean drinking water to the population, water transmission networks, water towers, pumping stations, the design, types and theory of operation of treatment facilities, as well as be able to select and calculate the appropriate elements.</i> <i>Develop professional knowledge, skills and abilities in providing water supply and sewerage to cities, rural settlements and industrial enterprises, types of water supply networks, methods of water transmission, hydraulic calculation of water supply systems, the basics of calculation and methods of selecting design solutions taking into account specific conditions.</i> • <i>Master methods for determining water flow in simple and</i>

	<i>complex pipelines, openings and pipes, calculating hydrostatic pressure on structures, hydraulic calculation of hydraulic and hydromeliorative structures, hydraulic calculation of pipes and pipeline systems, as well as modern methods of hydraulic calculations in water supply systems.</i>
Content	<i>Module 1: Water Supply Sources</i> <i>General information about natural water sources and their use for water supply purposes.</i> <i>Surface water sources for water supply.</i> <i>Groundwater sources for water supply.</i> <i>Module 2: Water intake structures</i> <i>Types of water intake structures and selection of their locations.</i> <i>Groundwater intake structures.</i> <i>Open source water intake structures and their types.</i> <i>Module 3: Treatment of natural water</i> <i>Methods of treating natural water.</i> <i>Reagent management and dispensers.</i> <i>Water clarification.</i> <i>Water filtration.</i> <i>Module 4: Water neutralisation and disinfection</i> <i>Methods of water neutralisation.</i> <i>Water chlorination.</i> <i>Water ozonation.</i> <i>Bactericidal irradiation of water.</i> <i>Module 5: Water consumption and usage patterns</i> <i>Main types of water consumers.</i> <i>Water consumption standards, determining water consumption.</i> <i>Module 6: Water supply system operating mode</i> <i>Water consumption for firefighting, distribution.</i> <i>Determining the volume of control and reserve capacities.</i> <i>Module 7: Calculation of the water supply system and water distribution</i> <i>General characteristics of water mains and water supply networks.</i> <i>Water withdrawal by consumers from the water supply network.</i> <i>Module 8: Interaction of pumping stations and control tanks in water supply networks.</i> <i>Module 9: Structure of water supply networks and water pipes</i> <i>Pipes used in water supply systems.</i> <i>Fittings used in water supply and network configuration diagram.</i> <i>Module 10: Wells and chambers in the network</i> <i>General concepts of water towers and tanks.</i> <i>Module 11: Designing water supply networks</i> <i>Drawing up design networks for the design and calculation of</i>

	<i>water supply networks.</i> <i>Module 12: Calculation and design of water distribution and supply systems using modern electronic computing tools.</i> <i>Determination of piezometric marks and effective free heads at nodes.</i> <i>Module 13: Building wastewater systems</i> <i>Equipment and devices in wastewater systems.</i> <i>Module 14: Sanitary equipment and its placement</i> <i>Module 15: Designing internal sewerage systems.</i>
Forms of assessment	<i>Oral work, presentations, written assignments, practical and laboratory work, as well as final exams.</i>
Requirements for study and assessment	<i>To successfully complete the module, students must attend classes and earn a minimum number of points on current, interim, and final assessments.</i>
Bibliography	<i>1. Mackenzie L. Davis. Water and Wastewater Engineering: Design Principles and Practice (1-3). USA. McGrawHill; 2020.</i> <i>2. Maulin P. Shah. Development in Wastewater Treatment Research and Processes: Innovative Microbe-Based Applications for Removal of Chemicals and Metals in Wastewater Treatment Plants. Amsterdam: Elsevier, 2022.</i> <i>3. I.I. Pavlinova. Water Supply and Wastewater Disposal. Moscow: Yurait, 2019.</i> <i>4. O.K. Novikova. Water Supply for Industrial Enterprises. Gomel: BelGUT, 2021.</i> <i>5. E.S. Buriev. Design of Water Supply Networks. Tashkent, 2017.</i> <i>6. B.B. Tulbaev. Water supply and wastewater disposal systems. 2023.</i> <i>7. E.A. Tursunova. Water supply for industrial enterprises. Tashkent, 2019.</i>
Reviewers	<i>Lecturers: J.T. Orzimoto – Associate Professor (PhD) of the Department of Engineering Communications Construction, Fergana State Technical University</i> <i>Z.E. Abdulhaev – Associate Professor (PhD) of the Department of Engineering Communications Construction, Fergana State Technical University</i>