

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

Engineering Geology

MODULE HANDBOOK

Field of study:	700000 – Engineering, processing, and construction fields
Field of education:	720000 – Manufacturing and processing
Education program:	60730300 – Civil Engineering

Module title	<i>Engineering Geology</i>
Code (if available)	<i>EGT34</i>
Semester(s) of module teaching	<i>3</i>
Responsible for the module	<i>Kayumov Odiljon Abduraufovich Associate Professor of the Department of Geodesy, Cartography, and Cadastre</i>
Language of instruction	<i>Uzbek</i>
Connection to the curriculum	<i>elective</i>
Teaching methods	<i>Lecture, practical session, independent study.</i>
Study load (including classroom and independent study hours)	<i>Total hours: 120 hours Auditorium hours: 48 hours Lecture – 16 hours, Practical session – 32 hours, Independent study – 72 hours</i>
Credit units	4
Required and recommended prior knowledge for studying the module	<i>Mathematics, Construction Geodesy, Remote Sensing and Photogrammetry, Soil Science</i>
Module objectives/intended learning outcomes	Module Objective: <i>The goal of this module is to improve the organization of the efficient use of all resources in the deepening of economic reforms and the development of the construction sector in our country. For this reason, the achievements of the subject "Engineering Geology" are currently being widely applied in the construction of buildings, structures, and roads. Considering that the construction sector is inconceivable without the subject of Engineering Geology, special attention is given to its study in our country. Students training in this field are required to gain an in-depth understanding of the subject. This discipline is considered a general professional subject and is an integral part of construction-related industries such as building, structural, and road construction.</i> <i>The subject aims to provide students in the construction field with knowledge about the shape and size of the Earth, its internal and external structure, the geological processes occurring within it, types of rocks, minerals, groundwater, soil types at construction sites, and their physical and mechanical properties. It also includes the study of how to conduct engineering and geological surveys at construction sites and how to apply the results in the design, construction, and operation of buildings and structures.</i> <i>This course is designed for students majoring in Geodesy, Cartography, and Cadastre (according to functional specialization) and related fields.</i>
Content	<i>Module 1. Origin and Age of the Earth</i> <i>Origin of the Earth. Geological time and its units. Geochronological chart. Internal structure of the Earth. Internal boundaries of the Earth. Brief description of the geosphere. Physical properties of the Earth's geosphere.</i> <i>Module 2. Internal and External Dynamic Processes of the Earth</i> <i>Forms of magmatism formation. Intrusive magmatism. Effusive magmatism and volcanism. Metamorphism of rocks.</i> <i>Module 3. Groundwater</i> <i>State and types of water in rocks. Groundwater (phreatic water).</i>

	<i>Artesian water. Impact of groundwater on construction works.</i> <i>Module 4. Sedimentary Rocks and Their Bedding Forms</i> <i>Stages of formation of sedimentary rocks. Mineral composition, structure, and texture of sedimentary rocks. Bedding forms of sedimentary rocks. Use of sedimentary rocks in construction.</i> <i>Module 5. Physical and Mechanical Properties of Rocks</i> <i>Physical properties. Mechanical properties. Hydraulic (water-related) properties.</i> <i>Module 6. Engineering Geological Phenomena</i> <i>Characteristics and distribution of earthquakes. Earthquake recording. Earthquake prediction. Landslides and displacements.</i> <i>Module 7. Types of Engineering-Geological Investigations</i> <i>Geological surveys at construction sites. Soil sampling at construction sites. Hydrogeological investigations at construction sites.</i>
Forms of assessment	<i>Oral assessments, presentations, written works, practical assignments, and final exams.</i>
Requirements for study and assessment	<i>To successfully complete the module, the student must attend classes and obtain the minimum required scores in current, midterm, and final assessments.</i>
Bibliography	1. Butyugin V.V., Lolaev A.B. <i>Engineering Geology</i>, Moscow: Infra-Engineering Publishing, 2022, 256 pages. 2. Saparov A.S., Rakhimbabayeva M., Rakhmatullayeva I. <i>Geology and Geomorphology</i>, Tashkent, 2019, Publishing House of the Philosophical Society of Uzbekistan, 208 pages. 3. Richard G. Craig, Jesse L. Craft – <i>Applied Geomorphology: Binghamton Geomorphology Symposium 11</i>, 2021, Routledge. 4. Ananyev V.P., Patapov A.D. <i>Engineering Geology</i>, Moscow: Higher School Publishing, 2008. 5. Irgashev I. <i>Engineering Geology and Hydrogeology</i>, Tashkent: O'qituvchi Publishing, 1990. 6. Irgashev I. <i>Practical Exercises on the Fundamentals of Engineering Geology and Hydrogeology</i>, Tashkent: O'qituvchi Publishing, 1990. 7. Sedenko M.V. <i>Hydrogeology and Engineering Geology</i>, Moscow: Nedra, 1971, 272 pages. 8. Charygin M.M. et al. <i>General and Historical Geology</i>, Moscow: Nedra, 1977, 472 pages. 9. Solodukhin M.A. <i>Engineering Geological Surveys for Industrial and Civil Construction</i>, Moscow: Nedra, 1975, 191 pages.
Reviewers	<i>K. Khakimova – Associate Professor, Department of Geodesy, Cartography, and Cadastre, Fergana State Technical University</i> <i>A. Marupov – Associate Professor, Department of Geodesy, Cartography, and Cadastre, Fergana State Technical University</i>