

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

Information Technology

MODULE HANDBOOK

Field of knowledge: 700000 – Engineering, Energy and Construction Sciences

Educational field: 730000 – Architecture and Construction

Education program: 60730300 – Civil Engineering

Module name	Information Technology
Code (if available)	ITM25
Semester(s) of module teaching	2
Responsible for the module	Norbutaev Masujon Abdurakhmanovich, Senior Lecturer, Department of Information Systems and Technologies Olimova Odinkhon Satvoldievna, Senior Lecturer, Department of Information Systems and Technologies
Language of instruction	Uzbek
Connection to the curriculum	Compulsory
Teaching methods	Lectures, laboratory work, independent study
Study load (including contact hours and independent study)	Total: 150 hours Auditorium hours: 60 hours Lectures – 24 hours, laboratory work – 36 hours, independent study – 90 hours
Credit units	5
Required and recommended prerequisites	Higher mathematics, engineering and computer graphics, English
Module objectives / Expected learning outcomes	The aim of the module is to provide students with the necessary theoretical and practical knowledge in the field of computer systems, software, data management, networks, programming, information security and digital communications. To achieve this goal, the course covers the theoretical foundations of modern information technologies and their practical application, the development of digital literacy, network interaction skills, information security, and programming. Upon completion of the course, students should: • know the main components of computer systems, their functions, and operating principles; • be able to distinguish between types of system and application software and understand their purpose; • be able to use MS Office programmes and cloud office services (Google Docs, etc.) effectively; • be able to create simple databases, compose queries and manage them; • understand the principles of local and global networks, as well as the main Internet technology services (WWW, FTP, e-mail); • master the basic concepts of information security (confidentiality, integrity, availability) and be able to apply data protection methods in practice; • possess knowledge of the basics of programming, develop algorithmic thinking and be able to develop simple programs; • be able to use the capabilities of cloud technologies, organise file sharing and storage, as well as online collaboration; • master the skills of information exchange and remote work using modern means of digital communication.
Content	Module 1. Information and Information Technology The concept of information, types of information, characteristics and properties of information, number systems and information encoding, units of measurement for information, information processes, the concept of information technology, the emergence and stages of development of information technology.

	<i>Module 2. Components of information technology</i> <i>The concept of an interface, the concepts of a file and a directory, technical support for information technology (personal computers and their components, mobile computing devices and SMART devices), information technology software: application software (PC applications, web applications, mobile applications, technical applications), system software (PC operating systems, network operating systems, mobile operating systems, operating systems of technical devices, firmware, drivers, utilities, programming tools).</i> <i>Module 3. Information processing using office software</i> <i>Text editors (simple text editors, integrated development environments – IDE), word processors (word processors for PCs, mobile devices, online word processors), the concept of a spreadsheet, spreadsheet processors (for PCs, mobile devices, online spreadsheet processors), the concept of a presentation, tools and technologies for preparing presentations on a computer, mobile devices and online.</i> <i>Module 4. Big Data Processing Technologies</i> <i>The concept of databases and Big Data (types and forms of databases, basic concepts and terms, connections), database management systems (classification of DBMSs according to their operating principles), client-server, file servers, engines, database programming technologies (SQL language family, NoSQL database management languages).</i> <i>Module 5. Multimedia technologies: processing of graphic and animation information</i> <i>The concept of multimedia, types, characteristics and technologies of audio and video information, means of digitising audio and video signals, means of processing audio and video information, concepts of computer graphics and animation, types of computer graphics (raster, vector, fractal, two-dimensional and three-dimensional graphics), colour models, means of processing graphic and animation information: technical means (devices for inputting static and dynamic signals, devices for inputting three-dimensional graphics), software means (programs for working with raster, vector, fractal and three-dimensional images).</i> <i>Module 6. Computer networks and services</i> <i>The concept of a computer network (types of computer networks, network topology, network protocols), the main components of computer networks (hardware and software), network services (e-mail, teleconferencing, FTP, Telnet, WWW, DNS, IRC), network capabilities (IoT, Industry 4.0, internet banking, billing systems, e-government).</i> <i>Module 7. Hypertext and the World Wide Web</i> <i>The concept of WWW service and hypertext, the concepts of a website, web page, web portal, social networks and messengers, web servers and hosting, markup languages, Front End, Back End</i>
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	<i>and Full Stack programming technologies, frameworks.</i> Module 8. Information Security <i>Information security and information protection (the concept of information protection, the modern concept of information security, threats and their types, regulatory and legal documents on information security and data protection, international standards in the field of information protection), methods of cryptographic information protection (concept of cryptography, simple ciphers and their properties, public and private key encryption systems, electronic signature), hardware and software tools for ensuring information security.</i> Module 9. Automated information systems <i>Basic concepts and terms (project, design, automation), CAD/CAM/CAE systems (graphical engineering systems, engineering design systems, engineering programming environments).</i> Module 10. Specialised systems and programmes for professional fields <i>Educational systems (Learning Management System (LMS), Content Management System (CMS), Learning Content Management System (LCMS)), engineering software (for energy, mechanical engineering, mechatronics and electrical engineering, mechanics, construction and architecture, natural sciences, economics and accounting, manufacturing and services).</i> Module 11. Knowledge-based systems <i>Basic concepts and terms (production models, semantic networks, frames, logical models, abstract knowledge), expert systems, machine learning, computer vision, artificial intelligence.</i> Module 12. Fundamentals of algorithmisation and programming <i>The concept of an algorithm and its history, properties of algorithms, types and methods of representing algorithms, concepts of programmes and programming, modern programming languages (web languages, PC languages, mobile languages).</i>
Forms of assessment	<i>oral examination, presentation, written assignments, laboratory work and final examinations</i>
Requirements for study and assessment	<i>For successful completion of the module, the student must attend classes and earn the minimum number of points in the current, intermediate and final assessments.</i>
Bibliography	Main Literature 1. <i>Computer Aided Design and Manufacturing (1–2), Zhuming Bi, Tutorial, USA: Wiley, 2020, 617 pages.</i> 2. <i>Information Technologies in Construction, U. Shadmanova, Study Guide (Latin, Uzbek), Tashkent: National Society of Philosophers of Uzbekistan, 2018, 166 pages.</i> 3. <i>Information Technologies, M. Kadirov, Study Guide (Latin, Uzbek), Tashkent: Sano Standart, 2018, 320 pages.</i> 4. <i>Information Technologies in Technical Systems, L.</i>

	<i>Mamadaliyeva et al., Study Guide (Latin, Uzbek), Fergana: FarPI, 2019, 96 pages.</i> <i>Information Technologies in Technical Systems, Part 2, M. M. Kadirov, Textbook (Latin, Uzbek), Tashkent: Innovatsiya-Ziyo, 2020, 284 pages.</i> <i>Information Technologies in Technical Systems, Part 2, M. M. Kadirov, Textbook (Latin, Uzbek), Tashkent: National Society of Philosophers of Uzbekistan, 2019, 306 pages.</i> <i>Information Technologies in Technical Systems, Sha. A. Akbarova, Textbook (Latin, Uzbek), Tashkent: Donishmand Ziyosi, 2022, 304 pages.</i> <i>Information Technologies in the Field, O. S. Nazarmatov et al., Textbook (Latin), Fergana: FarPI Alpha, 2022, 184 pages.</i> <i>Fundamentals of Information Security, A. N. Qudratov et al., Textbook (Latin, Uzbek), Tashkent: NIF MSH, 2024, 248 pages.</i> <i>Information Security, L. K. Mamadaliyeva et al., Textbook (Latin, Uzbek), Tashkent: Navro'z, 2020, 184 pages.</i> <i>Information Complexes and Technologies in the Economy, A. A. Akayev et al., Textbook (Latin, Uzbek), Tashkent: Fan va Texnologiya, 2019, 447 pages.</i> <i>Information Technologies in the Economy, B. S. Axrarov, Study Guide (Latin, Uzbek), Tashkent: Fan va Texnologiya, 2018, 316 pages.</i> Supplementary Literature <i>Information Technologies in Education, G. Yuldasheva, Textbook (Latin), Tashkent: Mehr-nuri, 2024, 344 pages.</i> <i>Explanatory Dictionary of Information Technology Terms, U. Azimov, M. Komilova, Study Guide (Latin, Uzbek), Tashkent: Kafolat Print Company, 2022, 824 pages.</i> <i>Information Technologies for Chemical Engineering, A. T. Norqobilov et al., Textbook (Latin, Uzbek), Tashkent: Yoshlar, 2020, 256 pages.</i> <i>Information Technologies in Management Systems, Z. I. Abdumalikova et al., Study Guide (Latin, Uzbek), Fergana: Classic, 2021, 206 pages.</i>
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