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## Our university: brief historical survey.

The history of the university began in 1859, when the Goro-Goretsky Agricultural Institute was opened. Forestry faculties were established at the Gory-Goretsky Agricultural Institute and in Minsk Polytechnic Institute. They became a basis for the foundation of the Forestry Institute in Gomel.

At the beginning of the Great Patriotic War the Institute was evacuated to Sverdlovsk. After the war , the institute was transferred to Minsk. Later it was given the name of the Belarusian Technological Institute named after S. M. Kirov.

The University houses 10 faculties. There are Forestry Faculty, Forestry and Wood Technology Faculty, Organic Substances Technology Faculty, Chemical Technology and Engineering Faculty, Faculty of Print Technology and Media Communications, Economic Engineering Faculty, Faculty of Information Technology, Faculty of Extra Mural Studies(заочный), Faculty of Pre-University Training, Faculty of Social Professions. Also university graduates have the opportunity to go in a master's degree(*магистратура*).

The academic year is divided into two terms. During the terms students visit lectures and do laboratory and practical work. At the end of each term student pass credit tests and exams. The course of studies lasts 4–5 years.

The total number of students and employees(*персонал*) annually(*ежегодно*) at the university is more than 10,000 people. The university has programs for foreign students from Uzbekistan, Tajikistan, Azerbaijan, Iran, China, Nigeria, Iran, Iraq, Turkey.

## Our university: scientific and research work.

The BSTU is a scientific and research centre. The purpose of our research is to find solutions to significant problems faced by humankind. University scientists participate in various scientific and technical programs. The Belarusian State Technological University is the leading partner of national research programs “Forests of Belarus – Productivity, Sustainability, Efficiency”, “Mechanics, Technical Diagnosis, Metallurgy” and “Monitoring”.

Our university publishes the scientific journal “Proceedings (Труды) of BSTU". Annually the University researchers publish over 2,500 articles and reports. Our university cooperates with universities of Russia, Lithuania, Poland, Kazakhstan. The university has programs for foreign students from Uzbekistan, Tajikistan, Azerbaijan, Iran, China, Nigeria, Iran, Iraq, Turkey. BSTU organizes many international and national conferences. Students from all courses can take part in them.

The university has modern laboratories with all the equipment necessary for the educational process and scientific work. With the participation of a high-tech park research laboratories "game stream", epam systems, technical groups and leverex International were created in BSTU.

## BSTU today. Student life.

Student life is the most exciting and challenging time for students to explore new horizons and set a course for the future. We make new friends and find new hobbies.

The student campus has five dormitories where students can rest and study. The dormitories are located near the University’s academic buildings. Student Council (студсовет) organizes social and cultural activities of students. Various festivals such as “Student Spring”, “Student Autumn”, “Mother’s Day”, contests, meetings, discotheques, sport events take place at the dormitories.

Students interested in the arts join art, dance groups, choirs or student theatre. Exhibitions of students’ works are held at the student campus. Students can develop their creative abilities in such groups as “Magical Needles”, “Needlewoman”, “Do It Yourself”. Our university has professor vocal group “Akavita”, dance group “Gratsiya”, literary clubs “Poshuk”, “Pamyat”, “Krinitsa, “Spadchyna”, tourist club, football fan club and fitness club “Technologist”.

It’s hard to imagine student life without sport. The University has a modern sports complex with gyms for football, volleyball, basketball, athletics, arm-wrestling, Greco-Roman wrestling, sambo, karate, judo, table tennis. The Student Union organizes numerous events for students including volunteering every year. Student life is Unforgettable experience for everyone

## Science and technology: the importance of inventions to the progress of humanity.

Modern civilization is everything that has been achieved thanks to science. Science is systemized knowledge received through experimentation, observation and study. In their work scientists use different methods and techniques. They build up hypotheses, theories, perform experiments, explore, discover and invent.

Аmong the achievements of science are the discovery of penicillin by Alexander Fleming; the invention of the electric light bulb by Thomas Edison; the invention of the telephone by Alexander Bell; the invention of radio by Alexander Popov; the invention of television and the Internet.

The goal of science is to learn how nature works and to understand this world through research and experiments.

The tasks of science are collecting, describing, analyzing and explaining facts and phenomena. The branches of science (scientific disciplines) are divided into three groups (formal, natural, social). ***Formal*** sciences study mathematics and logic, ***natural*** sciences study natural phenomena. ***Social*** sciences study human behavior and societies.

## Science and technology: inventions, famous scientists and inventions.

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**Martin Cooper** is the creator of the first mobile phone.

**Philip Kahn** is the creator of the first solution for instant photo sharing in public networks. When Philippe Kahn wanted to share photos of his newborn daughter, there were no phones with camera. So he invented his own technology. He connected a digital camera, a Motorola phone and a laptop. It allowed Kahn to send pictures from the hospital to friends and relatives around the world. The photo of Philip's daughter was included in the collection "100 photos that changed the world" of magazine LIFE.

## Information Technology Industry on Belarus.

In the past several years Belarus has earned the reputation of the leading “IT country” in the Eastern European region. three companies with Belarusian roots entered the top-100 of the largest world companies in this sphere: EPAM Systems, IBA Group and Intetics Co.

The ***Hi-Tech Park*** was opened in 2005. The consumers of software developed by the Hi-Tech Park are world-famous corporations: Peugeot, Coca-Cola, Procter & Gamble, Colgate-Palmolive, Samsung.

Belarusian studio ***Wargaming.net*** released the online game World of Tanks in 2011. This company collected more than 90 thousand people on one server and set a record registered in the Guinness Book of Records.

Belarusian programmers have created the Viber messenger.

***TechArt Group*** specialists develop software for countries such as the United States and Western Europe. ***IBA Group*** is one of the largest developers in Central and Eastern Europe. They are engaged in complex projects in the banking sector, digitalization of public services. ***EPAM*** develops digital products and platforms, complex design and software solutions.

## Information systems and Technologies, types of computers, positive and negative impact of IT.

***Information technology (IT)*** is the application of computers to store, study, retrieve(*извлекать*), transmit, and manipulate data, or information. The term IT is commonly used as a synonym for computers and computer networks, but it also describes television and telephones. The conception of IT is closely associated with Information Systems.

***An information system (IS)*** is a system designed to create, store, process or distribute information. An example of an information system is a pencil and a piece of paper. The two objects themselves are just tools, but together they create a system for writing information

There are different types of computers

* **PC.** personal computer is any computer designed for general use by one person.
* **DESKTOP** is a personal computer that is not portable.
* **LAPTOP.** Also called notebooks, are portable computers that mix the display, keyboard, touchpad, processor, memory and hard drive and an built-in battery.
* **SMARTPHONES.** Smartphones are handheld-sized portable computers.
* **WORKSTATION** is a desktop computer that has a more powerful processor and additional memory.
* **SERVER** provides services to other computers over a network. Servers have powerful processors, lots of memory and large hard drives.
* **WEARABLE COMPUTERS** The latest trend in computing is wearable computers. Common computer applications (e-mail, database, multimedia, calendar/scheduler) are integrated into watches, cell phones, visors and even clothing. Users can use these devices for health and fitness, navigation, social networking, and gaming.

Other types of computers include TABLET COMPUTERS, MAINFRAME, SUPERCOMPUTERS

## Computer Essentials.

A computer system consists of hardware and software that work together.

The hardware consists of CPU, memory and peripherals. ***The CPU*** (Central Processing Unit)is an electronic circuit that executes computer programs. CPU operation can be divided into four basic steps: fetch, decode, execute, and write back.

A computer ***motherboard*** has slots and connectors for connecting PC components, such as: video cards, RAM (random access memory), processor, data drives and peripherals.  
A ***hard disk*** stores data and provides computer users with quick access to large amounts of data. A hard disk is a set of disks that record data in concentric circles known as tracks.

Random Access Memory, popularly known as ***RAM***, can temporarily store data. ***ROM*** or Read-only memory contains the startup programs used for bootstrapping a computer.

Computers have input devices such as a keyboard, computer mouse, microphone, and output devices such as a monitor and speakers. The monitor is a device for the visual reproduction of symbolic and graphic information. A *keyboard* is an input device for a computer. A *computer mouse* is a pointing. There are three basic types of mice: mechanical, opto-mechanical, and optical.

## The Development of Computers (generations), Artificial Intelligence.

**Generations of computer**   
The history of computer development consists of 6 generations. From generation to generation, computers have become more powerful and more affordable.  
1. *The first generation* of computers used vacuum tubes, were very expensive and enormous. They used a lot of electricity and generated a lot of heat. First generation computers relied on machine language and could only solve one problem at a time.   
2. *Second-generation* computers used transistors instead of vacuum tubes. They switched to assembly languages.   
3. *Third-generation* computers used integrated circuits. Transistors were miniaturized and placed on silicon chips, called semiconductors. It increased the speed and efficiency of computers. Users interacted(взаимодействовали) with computers through keyboards, monitors and an operating system. These computers could perform different operations at the same time.  
4. *Fourth generation* computers used microprocessors. Thousands of integrated circuits were built into a silicon chip. These computers used programming languages like C, C++, dBase. Computers could be connected on a network, these led to the development of the Internet.   
5. *Fifth-generation* computers based on artificial intelligence are still in development, but some applications already use voice recognition. These computers use high-level languages such as python, c, c++, java, etc. Fifth generation computers use parallel data processing and superconductors.  
6. *Sixth generation* computers are based on artificial intelligence. Artificial intelligence is an imitation of natural intelligence in machines that are programmed to learn and imitate the actions of people.

**Artificial intelligence**  
Artificial intelligence is used in many fields, including sports. Artificial intelligence analyzes the individual data of the players, their techniques and physical conditions. It uses this data to predict the potential of players and to make personal training or a diet. Another example of using AI technologies is predicting the results of matches. AI takes into account many factors, for example, the experience and physical condition of the players, weather conditions, the place of realization the match and makes sports forecasts.

## Computer Networks and Network Topology; LAN, WAN, MAN, etc.

**A** **Computer Network** is a system of connected computers, peripherals and communication devices that can exchange(*обмениваться*) data and share resources. If the network is limited to a single building or group of buildings, it is described as a **Local Area Network (LAN)**. Computers in a LAN can be linked together directly but more commonly they are linked through a hub or switch. The network connections can be cable, fiber-optic or wireless.

**A** **hub** is used to link computers and peripherals together in a cabled network. Data is sent to all connected ports resulting in a data collision.

**A switch** is used in the same way as a hub but the switch uses the IP address of the data packet to send the data to the correct device. It greatly reduces data packet collisions resulting in a faster network.

**A wireless access point** is a device that allows computers and printers etc. to connect to a wired network using radio waves rather than cabling.

***Client-server network***. On a client-server network there are two types of computers with two distinct roles. The server controls client computers. Several client computers are connected to server computers. this is where the user actually works.

***Peer-to-peer networks***. In a peer-to-peer network computers are linked together using cables and a hub or with a wireless connection. All the computers in the network have equal status so there is no server controlling the network. Any computer on the network can access data from of any other computer.

Network topology is a way to connect devices to a network. There are three common network topologies: ring; line (bus) and star.

***Ring topology*** is a peer-to-peer network. The devices are connected in a ring and data travels in one direction using a control signal called a ‘token’. If any device fails then the whole network will fail. It is inconvenient to modify it, because for this you need to disconnect the network.

***Bus (line) topology*** is a peer-to-peer network. Devices are connected to a main (bus) cable using special T-connectors.

*Advantages:* Failure of one device does not affect the rest of the bus network. Simpler than a ring topology to troubleshoot because sections can be isolated and tested independently.

*Disadvantages:* The bus cable has a limited length and if it fails then the whole network will fail. Performance of the network slows down rapidly with more devices.

***Star topology*** is a client-server network. A server is connected to the other devices through a switch or hub.

*Advantages:* The most reliable because the failure of one device does not affect other devices. Simple to troubleshoot. Easy to add extra devices. Adding extra devices does not greatly affect performance.

*Disadvantages:* installation is more expensive. If the hub/switch fails, the whole network will fail.

The largest **WAN (Wide Area Network)** is the Internet. Smaller examples of a global network include a national ATM network used by a bank to provide customers with access to cash.

*IP Addressing.* An Internet Protocol (IP) address is a unique address number that is allocated to devices on a computer network. Each address must be unique to identify the device on the network. This allows you to send data to the correct device. An IP address can be private or public

*MAC Addressing* (Media Access Control) MAC address is a unique 48-bit number assigned by the manufacturer to any hardware device. MAC addresses can only be used on a local network.

*Protocols.* A protocol is a description of the format that digital data should be presented and the rules for hardware/software to transmit that data.

The Internet Protocol (IP) is used to send data to the correct device

The Transmission Control Protocol (TCP) is used to exchange data directly between two networked computers.

*HTTP (HyperText transfer Protocol)* is used on the Internet to transfer web pages and files contained on them.

## Internet, WWW.

**The Internet** is a global network connecting millions of computers. In the early days, most people just used the Internet to search for information. Today the Internet helps many people communicate, work, learn, and have fun.

The Internet allows computers to send one another packets of digital data. The Internet uses the Transmission Control Protocol and the Internet Protocol for this.

*IP Addressing.* An Internet Protocol (IP) address is a unique address number that is allocated to devices on a computer network. Each address must be unique to identify the device on the network. This allows you to send data to the correct device. An IP address can be private or public

Packets of data are transmitted through a variety of cables, routers and host computers.

The Internet consists of many systems that offer different facilities to users. WWW, the World Wide Web, a collection of files or pages containing links to other documents on the Net. Most Internet services are now integrated on the Web.

if we talk about the site that I use most often on the Internet, this is vk.com. VK I use to listen to music and to chat with friends, because most of them use this network. I use Telegram to chat with my parents and friends who don't use VK and to download documents from our group chat. Telegram has a lot of cool free stickers and you can create your own.

I also often watch movies on websites like hdrezka.cm and kinogo. These services provide access to thousands of films, series and cartoons from different studios, such as HBO, BBC, FOX, Netflix, Disney. I like these sites because they are free. Another plus of these services is that you can choose the voice acting. For some movies, you can choose the original voice acting with or without subtitles. One more feature is that the sites remember the time when I stopped watching the movie.

## Software classes (programming, system, application) and types (freeware, shareware, etc.). Programming languages.

**Different Classes and Types of Computer Software**

**Computer software** is a general term used to describe a collection of computer programs, procedures and documentation that perform some tasks on a computer system. Software includes websites, programs, video games, etc.

There are different types of computer software.

***System Software*** coordinates the complete system hardware and provides an environment or platform for all the other types of software to work in. It is the most basic type of software. It is essential for other programs, applications and the whole computer system to function.

***Application Software*** is programs that help the user perform different tasks. It's non-essential software which is installed and run depending on the requirements of the software environment. (for example, MS Office, OpenOffice, media players, educational software, multimedia development software, antivirus software, etc.)

***Programming software*** is used to write, test, debug, and develop other software programs and applications. They are used for creating the system and application software. Different programming language editors, debuggers, compilers and Integrated Development Environments (IDE) are examples of programming software.

There are five additional subcategories of software. These are: Freeware; Shareware; Open Source Software; Closed Source Software; Utility Software.

***Freeware software*** is any software that can be used for free. They can be downloaded and installed over the internet without any cost.

***Shareware*** is paid software, that can be free for a limited period of time known as ‘trial period’.

***Open Source Software*** has an open-source code that is available to use for all users. It can be modified and shared with anyone for any purpose.

For ***Closed Source Software***, the source code is the intellectual property of software publishers. Only the original authors can copy, modify and share the software.

***Utility software*** is a subgroup of system software. They manage the performance of hardware and software. Some features of utility software include: Antivirus and security software; File compressor; Disk cleaner; Disk defragmentation software; Data backup software.

**High-level languages** are closer to human than machine languages. High-level languages include Java, C, C++, C#, Delphi, PHP, JavaScript, Python, Ruby

## Operating systems (definition, classifications, types), systems (definition, classifications, types).

**An Operating System** (OS) is a powerful program that manages and controls the software and hardware on a computing device so as to make the device behave in a predictable but flexible way. An OS acts an interface between a user and a device. All the computers and computer-like devices have Operating System, including laptop, desktop, or any other smart computing system like a smart phone or a smart watch.

1. One of the main functions of OS is to manage the primary and secondary memory. All the memory devices such as hard disk and pen drive are managed by OS.  
2. An OS with help of drivers controls device communication.  
3. OS decides which process will get the processor when and for how long.  
4. OS allocates and deallocates the resources and controls System Performance.  
5. An OS by using password and other similar techniques prevents and checks unauthorized users to access the data and program.  
*Types of Operating Systems*  
Operating systems can be categorized in to four types Real Time Operating System; Single User Single Task OS; Single User Multi Tasking OS; Multi User OS.

***A Real Time Operating System*** is a time bound operating system which has fixed time limits. Processing has to be done in a certain period of time or the system will fail. Examples of Real Time systems are Air Traffic, Control Systems, Command Control Systems etc.

***Single User Single Task OS*** is a system in which only one program can be executed at one time. It manages the computer in a way that one user can successfully perform one task at a time. The problem of this type is that the programs have to be placed in a queue to be performed.

***Single User MultiTasking Operating System*** allows a single user to work with several programs at the same time. Most people use this Operating System on their computers, laptop and desktops today. Best examples of these types of Operating System are Mac OS platform and Windows.

***Multi User Operating System*** allows different users on different computer to access a single System. A user at the terminal or desktop, through a network gets access to the system and other machines connected to the system, such as printers.

The most common operating systems are Windows, Mac OS and Linux.

Chrome operating system is based on Linux. This system is very simple to use and suitable for inefficient devices. You can give a second life to your old computer if it is not too old, but doesn't support modern software, and use it to surf the Internet. Chrome OS is much safer than Windows because most of the apps are downloaded from the Play Store and it also has a built-in antivirus program. Chrome OS is a cloud system. All Google Internet services are available to it, including Google Docs, Google Drive and Google Photos. This system is not powerful. Many applications work only with Internet access, so without the Internet, the functionality of the OS decreases. This OS is suitable for people who use a laptop only to view web pages, video, a game for Android devices.

## Computer viruses and Computer Security.

A computer virus is a malware program that is written to gain access to a computer without its owner’s permission. There are different types of computer viruses.

***1. Direct Action Virus***gets into the main memory, affects all programs/files/folder. Itdoesn’t delete system files but changes the system’s performance. It can affect all .exe and .com file extension.

***2. Overwrite Virus*** deletes the data and replaces the old code with their own. They replace the file content without changing its size. The only way to get rid of this virus is to delete all the infected files.

***3. Web Scripting Virus***can affect web browser. It is used to attack large sites like social networking, user review or email. Protection: Use real-time antivirus software, disable script, use cookie security

***4. Directory Virus***(also known as Cluster virus) infects the file by changing the DOS directory information. When you run a program, DOS first loads and executes the virus code before running the actual program code.

***5. Memory Resident Virus*** lives in primary memory (RAM) and get activated when you switch on the computer. They affect all files currently running on the desktop.

***6. Macro Virus*** is written in the macro language, so it can run automatically when the document is opened and it can easily spread to other files too. They are generally hidden in documents that are shared via email. Protection: Disable macros and don’t open emails from unknown sources and use antivirus software.

***7. Companion Virus*** does not modify the existing file. It creates a copy of a file with a different extension (usually .com) which runs in parallel with the actual program. It can delete the original files. Can affect: All .exe files.

***8. Trojan Horse*** can destroy or modify all the files, crash the computer and give hackers remote access to your PC. Protection: Use antivirus software.

***9. FAT Virus***. FAT or file allocation table is a section of storage disk. A FAT virus changes the index and the computer can't allocate the file. Protection:

Protection don’t open emails from unknown sources, don't download files from unknown sources and use antivirus software