



**SYLLABUS**  
**CSE6773 INFORMATION AND COMMUNICATION TECHNOLOGIES**

FOR EDUCATIONAL PROGRAM: 6B06102 COMPUTER SCIENCE

5 (2/1/0/2) credits

**Semester:** fall, 2023- 2024 academic year

**Almaty 2023**

## **1 Information about instructor(-s):**

### **1.1 Lecturer (-s):**

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*(Full name of the teacher, position)*

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### **1.2 Instructor(-s), conducting the practical/laboratory work**

#### **Moldagulova Aiman Nickolayevna**

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Learning format – online/ <https://polytechonline.kz/>

## **2 The purpose and the objective of the course**

### **The purpose:**

The purpose of the course «CSE6773 - Information and Communication Technology» is to equip students with the knowledge, skills, and competencies necessary to understand, use, and leverage technology effectively in various aspects of their personal and professional lives. ICT course is designed to provide a broad understanding of digital technologies, computer systems, software applications, and their practical applications.

### **The objective:**

1. Provide students with basic knowledge of computer hardware, software and operating systems.
2. Develop practical skills in using common software applications such as word processors, spreadsheets, and presentation tools.
3. Introduce students to Internet technology, email, and various communication tools to facilitate effective online communication.
4. Teach students to organize, store and retrieve digital information efficiently

and securely.

5. Provide knowledge about Internet safety, cybersecurity threats, and best practices for protecting personal and organizational data.

6. Develop skills to create and manage documents, spreadsheets and presentations using office productivity software.

7. Introduce concepts of databases and data management, including queries and reports.

8. Provide a basic understanding of programming concepts and their role in technology.

9. Teach the basics of web technologies, including HTML and CSS, for creating and editing web content.

10. Promote responsible and ethical behavior online, addressing issues such as online etiquette, privacy.

11. Apply technology to solve real-world problems and develop critical thinking skills.

12. Explore the role of ICT in modern government services and e-participation.

### **3 Course Description:**

The course is intended for students of the educational program «6B06102 COMPUTER SCIENCE». Information and communication technologies (ICT) is regarded as modern methods and means of communication of people in a normal and professional activities with the help of information technologies for the search, collection, storage, processing and dissemination of information.

The discipline of «ICT» serves for formation at students of a certain outlook in the information sphere and the modern information culture, i.e. ability purposefully to work with information, professionally using for receiving, processing, transmission and its storage.

This course is a top level exposure to computer hardware, software and communication systems. Students learn the functionality of hardware, software and network components as well as suggested best practices in maintenance and safety issues. Through hands-on activities and labs, students learn how to assemble and configure a computer as well as install operating systems and diagnostic application utilities. In addition, an introduction to networking is included. Students should be proficient in daily computer use (such as downloading and installing software from the Internet) and should be familiar with computer terms.

### **4 Learning outcomes**

<b>Expected outcomes (EO)</b>	<b>Indicators of achieving EO (at least 2 indicators for each EO)</b>
<b>1. Be able to:</b>	<b>1.1</b> explain the purpose, content and development trends of information and communication technologies, justify the choice of the most appropriate technology for solving specific problems;
	<b>1.2</b> explain methods of collecting, storing and processing information, ways of implementing

	information and communication processes;
	<b>1.3</b> describe the architecture of computer systems and networks, the purpose and functions of the main components
<b>2. Know:</b>	<b>2.1</b> use digital technologies
	<b>2.2</b> carry out project activities in the specialty using modern information and communication technologies
<b>3. Have skills:</b>	<b>3.1</b> improve digital skills and understand the basics of the digital economy
	<b>3.2</b> use information from Internet resources, cloud and mobile services to search, store, process and distribute information

### 5 Calendar and thematic plan

Week	Topic of the lecture	Topic of the practical work	Topic of the laboratory work	Reference to the literature	Task	Deadline
<b>Module 1</b>						
1	ICT as a digital industry. The role of ICT in key sectors of social development. ICT standards. ICT applications.		Finding, researching and using applications in a specific professional field.	Finding, researching and using applications in a specific professional field. [2] p. 10-24. [ 6 ] p.21-25.	Finding, researching and using applications in a specific professional field.	2 week
2	Introduction to Computer Systems. Types and components of computer systems.		Describe the differences between internal hardware devices. Description of the advantages and disadvantages of a personal/desktop computer, laptop, tablet and smartphone compared to others. Description of the differences in hardware and software in types of computers (PC, laptop, tablet, smartphone).	Describe the differences between internal hardware devices. Description of the advantages and disadvantages of a personal/desktop computer, laptop, tablet and smartphone compared to others. Description of the differences in hardware and software in types of computers (PC, laptop, tablet, smartphone). [2] p. 24-57.	Describe the differences between internal hardware devices. Description of the advantages and disadvantages of a personal/desktop computer, laptop, tablet and smartphone compared to others. Description of the differences in hardware and software in types of computers (PC, laptop, tablet, smartphone).	3 week
3	New technologies. Impact of new technologies. How new technologies		Identification and description of storage devices,	Identification and description of storage devices,	Identification and description of storage devices,	4 week

Week	Topic of the lecture	Topic of the practical work	Topic of the laboratory work	Reference to the literature	Task	Deadline
	affect everyday life.		associated media, and their uses. Connect devices to each other via Wi - Fi and Bluetooth .	associated media, and their uses. Connect devices to each other via Wi - Fi and Bluetooth. [2] p. 57-76.	associated media, and their uses. Connect devices to each other via Wi - Fi and Bluetooth.	
4	Human-computer interaction. User-friendly interface. Ergonomics. User interface as a means of human interaction with a computer.		Application interface design. Application interface sketch.	Application interface design. Application interface sketch. [2] p. 96-120.	Application interface design. Application interface sketch.	5 week
<i>Module task</i>						
<b>Module 2</b>						
5	File management. Software tools for preparing a basic document appropriate for the purpose and target audience.		Use of software tools to prepare a basic document that is appropriate for the purpose and target audience. Working with a document in web-based software in collaboration with other users.	Use of software tools to prepare a basic document that is appropriate for the purpose and target audience. Working with a document in web-based software in collaboration with other users. [2] p. 76-96.	Use of software tools to prepare a basic document that is appropriate for the purpose and target audience. Working with a document in web-based software in collaboration with other users.	6 week
6	Data storage and processing. Definition of the terms "flat file database" and "relational database". Software tools for proper storage of data in a database. Creating a database structure. Data manipulation. Using SQL . Data presentation. Generating reports to display all the necessary data.		Search a database to select a subset of data. Create reports to display data from the database that is relevant to the purpose and audience.	Search a database to select a subset of data. Create reports to display data from the database that is relevant to the purpose and audience. [2] p. 120-144.	Search a database to select a subset of data. Create reports to display data from the database that is relevant to the purpose and audience.	week 7
7	Data analysis and processing. Creating a data model. Using spreadsheets for input and editing		Creating and editing data in spreadsheets Manipulating data in spreadsheets	Creating and editing data in spreadsheets Manipulating data in spreadsheets. [2] p. 147-185.	Creating and editing data in spreadsheets Manipulating data in spreadsheets	8 week

Week	Topic of the lecture	Topic of the practical work	Topic of the laboratory work	Reference to the literature	Task	Deadline
8	Data manipulation. Data presentation. Using functions to improve your spreadsheet,		Working with a video editor, animation. Create presentations using transitions and animation. Using streaming media.	Working with a video editor, animation. Create presentations using transitions and animation. Using streaming media. [3] p. 125-142.	Working with a video editor, animation. Create presentations using transitions and animation. Using streaming media.	Week 9
	<i>Module task</i>					
	<b>Mid-term control – The first attestation</b>					Week 8
<b>Module 3</b>						
9	Multimedia technologies. Tools for developing multimedia applications. Using multimedia technologies for planning, describing business processes and their visualization.		Recording and editing of film and sound using appropriate tools. Settings streaming multimedia	Recording and editing of film and sound using appropriate tools. Settings streaming multimedia. [2] p.185-218.	Recording and editing of film and sound using appropriate tools. Settings streaming multimedia	10 week
10	Networks and telecommunications. Types of networks. Wired and wireless network technologies. Technologies Internet connection . –		Network monitoring. Traffic analysis. Working with the main network utility ( ping , netstat , whois ). etc. ).	Network monitoring. Traffic analysis. Working with the main network utility (ping, netstat, whois ). etc. ). [3] p.61-85	Network monitoring. Traffic analysis. Working with the main network utility (ping, netstat, whois ). etc. ).	11 week
11	Internet technologies and online communication. Social media. Cloud technologies. Internet of Things.		Searching for reliable information on the Internet. Creating a blog. Using web conference ( Skype , Zoom , Google Meet , M.S. Teams and others).	Searching for reliable information on the Internet. Creating a blog. Using web conference (Skype , Zoom, Google Meet, M.S. Teams and others). [3] p.61-85	Searching for reliable information on the Internet. Creating a blog. Using web conference (Skype , Zoom, Google Meet, M.S. Teams and others).	12 week
12	Search engines. Levels of web development. Creating a web page.		Creating a web page using software tools to properly place content on the web page.	Creating a web page using software tools to properly place content on the web page. [3] p.188-219 [ 6 ] p.45-51.	Creating a web page using software tools to properly place content on the web page.	Week 13

Week	Topic of the lecture	Topic of the practical work	Topic of the laboratory work	Reference to the literature	Task	Deadline
<i>Module task</i>						
<b>Module 4</b>						
13	Electronic technologies: Electronic business; e-learning; Electronic government. Basic models Electronic business. Information infrastructure of electronic business. Legal regulation in electronic business. E-learning. Electronic government		Working with services on the e-government website	Working with services on the e-government website. [3] p.17-46	Working with services on the e-government website.	Week 14
14	Digital safety and security. Data security. Cybersecurity and Internet control.		Internet data security: identifying and preventing threats. Detection and prevention of computer viruses.	Internet data security: identifying and preventing threats. Detection and prevention of computer viruses. [3] p. 223-253.	Internet data security: identifying and preventing threats. Detection and prevention of computer viruses.	Week 15
15	Prospects for the development of ICT. Prospects for development in the IT market. Formation of an IT entrepreneurship ecosystem and support for small startup companies.		Assess the use of IT equipment and develop strategies to minimize health risks.	Assess the use of IT equipment and develop strategies to minimize health risks. [3] p. 255-272. [ 6 ] p. 66-70.	Assess the use of IT equipment and develop strategies to minimize health risks.	Week 15
	<i>Module task</i>					
<b>End-of-term – The second final attestation</b>						Week 15
<b>Examination</b>						Based on the schedule

## 6 Literature and resources

Literature	Internet resources (the links should be active)
1. June J. Parsons and Dan Oja , New Perspectives on Computer Concepts 2018: Comprehensive, 20th Edition, Course Technology Press, 25 Thompson Pl., Boston, MA, COPYRIGHT © 2018.	6. Kolienco T.S., Podosinova Ya.I. Economics in Information Technology: A Reader . For bachelor students in the areas of “Business Informatics”, “ Applied Informatics ”. – М.: RUT (MIIT), 2020. -69 p.
2. Shynybekov DA, Uskenbayeva RK, Serbin VV, Duzbayev NT, Moldagulova AN, Duisebekova KS, Satybaldiyeva RZ, Hasanova GI, Urmashhev BA Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU,	7. Шевчук Е.В Информационно-коммуникационные технологии INFORMATION AND COMMUNICATION TECHNOLOGIES учебно-методическое пособие 2020

2017. - 588 p., ISBN 978-601-7911-03-4 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan).	<a href="https://elib.kz/kk/search/read_book/1729/">https://elib.kz/kk/search/read_book/1729/</a>
3. Shynybekov DA, Uskenbayeva RK, Serbin VV, Duzbayev NT, Moldagulova AN, Duisebekova KS, Satybaldiyeva RZ, Hasanova GI, Urmashhev BA Information and communication technologies. Textbook: in 2 parts. Part 2, 1st ed. - Almaty: IITU, 2017. - 622 p., ISBN 978-601-7911-04-1 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan).	8. Шевчук Е.В. Информационно-коммуникационные технологии Artificial Intelligence Applications in Information and Communication Technologies [Электронный ресурс] 2015 <a href="http://link.springer.com/openurl?genre=book&amp;isbn=978-3-319-19832-3">http://link.springer.com/openurl?genre=book&amp;isbn=978-3-319-19832-3</a>
4. Urmashhev BA Information and communication technology: Textbook / BA Urmashhev . – Almaty, 2016. - 410 pages, ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)	9. Jantassova D.D. Информационно-коммуникационные технологии Computer-Assisted Language Learning: Course Book 2020 <a href="https://elib.kz/kk/search/read_book/2499/">https://elib.kz/kk/search/read_book/2499/</a>
5. Victoria Wright and Denise Taylor, Cambridge IGCSE ICT Coursebook, Cambridge University Press; 2 edition April 2019.	10. Белаш В.Ю. Информационно-коммуникационные технологии, компьютерная графика Информационно-коммуникационные технологии 2021 <a href="https://www.iprbookshop.ru/epd-reader?publicationId=111181">https://www.iprbookshop.ru/epd-reader?publicationId=111181</a>

\* The literature is available in the electronic resources of the library.

\*\* The main literature should not be older than 10 years.

~ The literature is available on the teacher's learning portal.

- E-library of University- [library@satbayev.university](mailto:library@satbayev.university);
- Republic interinstitutional e-library (RIEL) - <http://rmebrk.kz/>;

## 7 Competence framework

Learning Descriptors	Competences				
	Natural science and theoretical worldview	Socio-personal and civil	General engineering professional	Cross-cultural and communicative	Special-professional
Knowledge and comprehension		understanding the basics of the digital economy		capable of generalization, analysis, perception of information, setting goals and choosing ways to achieve it	use of digital technologies
Application of knowledge and comprehension			use basic methods, ways And facilities receiving, storing, processing information		
Expression of judgments and analysis of actions		capable work With information V global computer networks			
Communication and creative abilities				capable understand essence And meaning information V development of	



				modern information society	
Self-learning and digital skills	work with a computer as a control tool information		evaluate information V region professional activities		apply methods mathematical processing information, theoretical And experimental research

### 8 Schedule of submission of mandatory assignments

# s/n	Type of control	Max score of the week	Weeks															Total max points
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	Activeness in lecture discussions																	
2	Task execution (TSIS)	2,5				2,5				2,5				2,5			2,5	
3	Student Independent Study (SIS)	2,5				2,5				2,5				2,5			2,5	
4	Performing the practical/laboratory tasks	5				5				5				5			5	
6	1 <sup>st</sup> attestation	10																
8	2 <sup>nd</sup> final attestation	10																
9	Final exam*	40																
	<b>In total</b>																<b>100</b>	

### 9 Evaluation rating and possible final versions of assessments according to criteria

Letter grade	GPA	scores	Criteria
A	4	95-100	Shows the highest standards of knowledge, exceeding the volume of the course taught
A-	3,67	90-94	Meets the highest standards of knowledge
B+	3,33	85-89	Very good and meets high standards of knowledge
B	3	80-84	Good and meets most high standards of knowledge
B-	2,67	75-79	More than sufficient knowledge approaching high standards
C+	2,33	70-74	Sufficient knowledge that meets the general standards
C	2	65-69	Satisfies and conforms to most common knowledge standards
C-	1,67	60-64	Satisfies, but according to some knowledge does not meet the standards
D+	1,33	55-59	Minimally satisfying, but does not meet the standards for a large range of knowledge
D	1	50-54	Minimally satisfactory passing score with questionable compliance with standards
FX	0,5	25-49	Temporary assessment: Unsatisfactory low indicators, retake of the exam is required
F	0	0-49	Didn't try to master the discipline. It is also exposed when a student tries to get a grade on the exam by cheating

I	0	0	Temporary assessment: A student who completed most of the course successfully, did not complete the final control measures due to valid circumstances
W	0	0	The student voluntarily withdrew from the discipline and did not master it until the 6 <sup>th</sup> academic week
AW	0	0	The student was removed from the discipline by the teacher for systematic violations of academic order and rules

### 10 Evaluation criteria

Each work except tests is evaluated according to 4 criteria:

- precision and accuracy (P) – 30% (how accurately and neatly the work is calculated);
- inventiveness and creativity (I) – 30% (how and in what way the work is presented);
- completeness and maturity (C) – 40% (how profoundly, logically and structurally the work is solved);
- originality (O) – a special coefficient of 1.0, 0.5 or 0 is used.

Criteria	Excellent (0.9-1.0)	Good (0.7-0.9)	Satisfactory (0.4-0.7)	Unsatisfactory (0-0.4)
precision and accuracy	0.3	0.25	0.2	0.1
inventiveness and creativity	0.3	0.25	0.2	0.1
completeness and maturity	0.4	0.3	0.3	0.1
originality	1	1		1

The overall score will be calculated due to the formula:

$$Score = (A + T + 3) \times O$$

### Maximum assessment of knowledge based on type of tasks

Tests and activeness	
Student Independent Study (SIS)	20
Practical classes and bonus	
Laboratory classes	20
1st attestation (Midterm)	10
Course project	
2 <sup>nd</sup> final attestation (End-of-term)	10
Final exam	<b>40</b>
<b>In total</b>	<b>100</b>

### 11 Late submission policy

The student must come prepared for lectures and practical (laboratory) classes. Timely protection and full performance of all types of work (practical and independent) is required. The student should not be late and miss classes, be punctual and mandatory. It is planned to reduce the maximum score by 10% for untimely

work. If you are forced to skip the intermediate certification for good reasons, you should warn the teacher in advance before it, so that you can pass the boundary control in advance. Skipping an exam for a disrespectful reason deprives you of the right to take it. If you miss the exam for a good reason, a special permit is issued and the date, time and place of the exam are assigned.

## **12 Academic Conduct and Ethics Policy**

Be tolerant, respect the opinions of others. Formulate objections in the correct form. Plagiarism and other forms of dishonest work are unacceptable. Prompting and cheating during exams, passing the exam for another student are unacceptable. A student caught falsifying any course information will receive a final "F" grade.

*Activeness* in lectures and practical classes is mandatory and is one of the components of your final score / assessment. Many theoretical questions supporting the lecture material will be presented only at lectures. Therefore, skipping a class can affect your academic performance and final grade. However, attending classes in itself does not mean an increase in points. Your constant active participation in the classes is necessary. A mandatory requirement of the course is to prepare for each lesson. It is necessary to review the specified sections of the textbook and additional material not only in preparation for practical classes, but also before attending the corresponding lecture. Such training will facilitate your perception of new material and will contribute to your active acquisition of knowledge within the walls of the university.

**Support:** For advice on implementing the independent work, their submission and defending, as well as for additional information on the material covered and all other questions arising on the course being read, contact the teacher during their office hours or via electronic means of communication during working hours.

### **During the process of learning:**

Mandatory participation in training sessions according to the schedule, which determines the readiness for the lesson. In case of absence, the student is obliged to notify the teacher within a day and explain the plan for self-study of the study material:

- mandatory reading of the presented materials before the lesson;
- submission of tasks on time;
- 20% non-participation in the audience (for a valid reason with the supporting documents) - rating "F (Fail)";
- plagiarism and cheating during the execution of the task are not allowed;
- mandatory use of electronic gadgets in the classroom that is welcome, but it is unacceptable to use them in the exam.

Within the framework of training in the discipline, any corruption manifestations in any form are unacceptable. The organizer of such actions (teacher, students or third parties on their behalf) are fully responsible for violating the RK laws.

Considered at the meeting of Department Software Engineering

Minutes # 1 dated August 25, 2023

**Head of the department**



**A.N. Moldagulova**

**Syllabus designer**



**A.N. Moldagulova**