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English for specific purposes. Information security.

Part I

Учебно-методическое пособие

Текстовое электронное издание



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Учебно-методическое пособие представляет собой первую часть учебно-методического комплекса по английскому языку для студентов, обучающихся по программам высшего образования по направлениям подготовки 10.03.01 «Информационная безопасность» и 10.05.05 «Безопасность информационных технологий в правоохранительной сфере». Пособие состоит из четырех тематических разделов, раскрывающих основное содержание будущей профессиональной деятельности специалистов в области информационных технологий, информационной безопасности, и направлено на развитие иноязычных коммуникативных навыков.

В пособии использованы аутентичные материалы, относящиеся к учебно-профессиональной сфере и способствующие формированию у студентов общекультурных и профессиональных компетенций, определенных в ФГОС ВО(3++). Данное пособие может использоваться для аудиторной и самостоятельной работы.

Минимальные системные требования:

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Introduction

Учебно-методическое пособие направлено на развитие у обучающихся иноязычной коммуникативной компетенции, необходимой для осуществления профессиональной деятельности в современном цифровом обществе, в частности в области информационной безопасности. Основные задачи пособия - актуализация специфики осуществления профессиональной деятельности в условиях всесторонней информатизации общества, расширение лексического запаса по предлагаемым темам, являющегося основой для совершенствования коммуникативных умений студентов.

Содержание учебно-методического пособия организовано тематически и представлено последовательно от вопросов социального характера к обращению к профессионально-ориентированной проблематике. Каждая тема включает разделы:

- Warm-up- предтекстовые задания.
- Reading and Language Study- текстовые и лексико-грамматические задания.
- Speaking- послетекстовые задания, направленные на развитие навыков монологической/диалогической речи.
- Writing- послетекстовые задания, направленные на развитие навыков письма.
- Revision- задания, контролирующие уровень сформированности лексических и грамматических навыков.

Данная логика расположения учебных заданий отражает современные принципы методики обучения иностранным языкам: переход от рецептивных и репродуктивных упражнений к продуктивным заданиям; последовательное усложнение предлагаемого материала; коммуникативный характер заданий; активизация умственной деятельности учащихся.

Относительная самостоятельность тематических разделов позволяет использовать их не только в предлагаемой последовательности, но и применять отдельные темы в зависимости от языковой подготовки студентов и их специализации.

Unit I

The Digital Age

Warm-up

1. Do you agree that we are living in the digital age? Why or why not?
2. What are the advantages of using computers?
3. What are the disadvantages?

Reading and Language Study 1

The Digital Age

Some people say that we are now living in the digital age, meaning that computers have become an essential part of our lives. Young people who have grown up with PCs and mobile phones are often called the digital generation. Computers help students to perform mathematical operations and improve their maths skills. They are used to access the Internet, to do basic research and to communicate with other students around the world. Teachers use projectors and interactive whiteboards to give presentations and teach sciences, history or language courses. PCs are also used for administrative purposes – schools use word processors to write letters, and databases to keep records of students and teachers. A school website allows teachers to publish exercises for students to complete online. Students can also enrol for courses via the website and parents can download official reports.

Mobiles let you make voice calls, send texts, email people and download logos, ringtones or games. With a built-in camera you can send pictures and make video calls in face-to-face mode. New smartphones combine a telephone with web access, video, a games console, an MP3 player, a personal digital assistant (PDA) and a GPS navigation system, all in one.

In banks, computers store information about the money held by each customer and enable staff to access large databases and to carry out financial transactions at high speed. They also control the cashpoints, or ATMs (automatic teller machines), which dispense money to customers. Customers insert their Chip and PIN cards into the Chip terminal and are asked to enter a four-digit personal identification number (PIN). This system makes transactions more secure. With online banking, clients can easily pay bills and transfer money from the comfort of their homes.

Airline pilots use computers to help them control the plane. For example, monitors display data about fuel consumption and weather conditions. Computers are also used to manage radar systems and regulate air traffic. On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

EXERCISE 1. Scan the text and find definitions to these terms:

- The digital age
- The digital generation
- A PDA
- A Smartphone
- An ATM
- A PIN

EXERCISE 2. Read the text and answer the questions.

1. Why do some people say that we are living in the digital age?
2. What are the advantages and the disadvantages of living in the digital age?
3. For what purposes do students use computers?
4. How are computers used for teaching?
5. How can a school website help teachers, parents and students?
6. What are the functions of mobile phones?
7. What are computers used for in banks?
8. How do computers control the cashpoints?
9. What do airline pilots use computers for?
10. What do travel agents use computers for?

EXERCISE 3. Read the statements and say whether they are true (T) or false (F). Correct the false ones.

1. Young people who have grown up with PCs and mobile phones are often called the next generation.
2. Computers help students to perform medical operations.
3. Students use projectors and interactive whiteboards teach sciences, history or language courses.
4. PCs are also used for administrative purposes – schools use word processors to write letters, and databases to keep records of students and teachers.
5. Students can also enroll for courses via the website and parents can download music and computer games.
6. Mobiles let you make voice calls, send texts, email people and download logos, ringtones or games.
7. In banks, computers send information about the money held by each customer to anyone who asks for it.
8. Customers insert their Chip and PIN cards into the Chip terminal and are asked to enter a five-digit personal identification number (PIN).
9. Airline pilots use computers to play computer games during flights.
10. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

EXERCISE 4. Read the text carefully and complete the sentences given below.

1. Some people say that we are now living in the ____ age, meaning that computers have become an ____ part of our ____.
2. Computers are used to ____ the Internet, to ____ basic ____ and to ____ with other ____ around the world.
3. PCs are also used for ____ – schools use ____ to write letters, and databases to keep ____ of students and teachers.
4. Students can also ____ for courses via the website and parents can ____ official reports.
5. With a ____ camera you can send pictures and make ____ in face-to-face ____.
6. New smartphones combine a telephone with ____, video, a games ____, an MP3 player, a ____ and a GPS ____, all in one.
7. In banks, computers enable staff to ____ large ____ and to ____ out ____ at high speed.
8. With online banking, clients can easily ____ and ____ money from the ____ of their homes.
9. Pilots look at monitors which ____ about ____ and ____.
10. Computers are also used to ____ radar systems and ____ air traffic.

EXERCISE 5. Find words in the text which have a similar meaning to:

- To carry out
- A screen
- To keep, save
- A client
- Integrated
- Important
- Information
- To let
- Over the Internet
- Monetary

EXERCISE 6. Match these words to make collocations from the text. Make up sentences using these word combinations.

- | | |
|-----------------|----------------------------|
| 1. to give | a) research |
| 2. to keep | b) a PIN |
| 3. to transfer | c) exercises |
| 4. to enter | d) presentations |
| 5. to access | e) transactions |
| 6. to carry out | f) calls |
| 7. to complete | g) databases, the Internet |
| 8. to do | h) money |
| 9. to make | i) records |
| 10. to store | j) texts |
| 11. to send | k) information |

EXERCISE 7. Use collocations from EX.6 to complete these sentences.

1. Thanks to Wi-Fi, it's now easy to _____ from cafes, hotels, parks and many other public places.
2. Online banking lets you _____ between your accounts easily and securely.
3. Skype is a technology that enables users to _____ over the Internet for free.
4. In many universities, students are encouraged to _____ using PowerPoint in order to make their talks more visually attractive.
5. The Web has revolutionized the way people _____ with sites such as Google and Wikipedia, you can find the information you need in seconds.
6. Cookies allow a website to _____ on a user's machine and later retrieve it; when you visit the website again, it remembers your preferences.
7. With the latest mobile phones, you can _____ with multimedia attachments - pictures, audio, even video.

EXERCISE 8. Find in the text the English equivalents for these Russian terms and expressions.

- важная часть
- пройти курс онлайн
- управлять онлайн-системой
- контролировать оплату
- доступ к базам данных
- оплачивать счета и переводить деньги с одного счета на другой

- регулировать работу
- отображать данные
- ввести пин-код
- выполнять (базовые) основные операции
- показывать презентации
- безопасные переводы
- доступ в интернет
- улучшить навыки
- использовать для административных целей
- Позволять клиентам
- выполнять финансовые транзакции
- хранить информацию
- записываться на курс
- банкоматы
- загружать (скачивать) изображения
- выдавать деньги

EXERCISE 9. Translate the following sentences from Russian into English.

- 1) Студенты обычно записываются на курсы через официальный вебсайт.
- 2) Смартфоны – важная часть нашей жизни.
- 3) Как вы оплачиваете счета и переводите деньги?
- 4) Как вы регулируете работу персонала?
- 5) Вы используете банковскую карту для оплаты товаров и услуг?
- 6) Как они подтверждают оплату?
- 7) Он не использует встроенную камеру очень часто.
- 8) У них нет доступа в нашу базу данных.
- 9) Она не закачивает музыку и картинки.
- 10) Как они совершенствуют свои навыки?
- 11) Преподаватели часто используют проекторы и интерактивные доски, чтобы показывать презентации.
- 12) Как вы общаетесь со своими друзьями?
- 13) Он всегда использует Интернет, чтобы узнать о наличии билетов и ценах.
- 14) С помощью компьютеров сотрудники выполняют финансовые транзакции на высокой скорости.
- 15) Как часто вы публикуете упражнения для студентов?
- 16) Вы посылаете сообщения с мультимедиа вложениями?
- 17) Какая программа позволяет пользователям бесплатно звонить и отправлять сообщения по Интернету?
- 18) Использует ли она онлайн банк?
- 19) Нужно ли мне вводить пин-код, когда я пользуюсь банковской картой?
- 20) Эта система позволяет клиентам проводить транзакции легко и безопасно.
- 21) Ваша компания хранит личные данные клиентов?
- 22) Она использует много разных сайтов, чтобы найти информацию, которую ей надо.
- 23) Ваш компьютер подсоединен к Интернету?
- 24) Наши преподаватели часто используют компьютеры для административных целей.
- 25) Я управляю своими счетами по Интернету.

Reading and Language Study 2

Uses of computers in various fields

The modern age is the age of Information technology. Computers have made a significant impact on our society. It is difficult to imagine our lives without a computer. The computer technology has importance in every field of life. Many types of computer are used in banks, business, communication, defense and military, education, medical sphere, transportation, multimedia, robotics, etc.

Today, computers are an important aspect of the defense industry. Military also employs computerized control systems. Some military areas where a computer is used are Missile Control, Military Communication, Military Operation and Planning, Smart Weapons.

The medical field is another place where computers are vital and used every day. More and more medical records are digitally stored. It allows for quick access and transfer of medical information. Computers help with monitoring a patient and can alert staff in the case of an emergency. Computers can assist in the diagnosis of a patient, from gathering a patient's history and conditions to comparing that information against a database of existing information. A lot of the medical research is computer assisted. Although humans still do most surgery, it becomes more practical and accessible for computer robot-assisted surgery. After being programmed, these robots can make surgery more accurate, faster, and less prone to human errors.

In most parts of the world, it's impossible to use a product or service that doesn't utilize a computer. The use of computer technology in business provides many facilities. Businessmen use computers to interact with their customers anywhere in the world. Each employee has a computer which allows them to produce work, solve problems for the company, to perform many business tasks more quickly and efficiently. An organization can use computers for marketing their products. Marketing applications provide information about the products to customers. Computer is also used to manage distribution system, advertising and selling activities. Stock Exchange is the most important place for businessmen. The stockbrokers perform all trading activities electronically.

EXERCISE 10. Scan the text and find the sentence with these collocations:

- a significant impact
- multimedia
- military and defense industry
- robotics
- computerized control systems
- missile control
- emergency
- robot-assisted surgery
- advertising and selling activities
- stock exchange
- to interact with customers
- to solve problems
- to monitor a patient
- to perform some trading activities
- to conduct bids

EXERCISE 11. Read the text and answer the questions.

1. Computers are involved into all areas of life, aren't they? Find examples.

2. How does the defense industry use computerized control systems?
3. Is a computer vital and important in the medical field? Find examples.
4. How can the use of computer technology change the business process?
5. How do stockbrokers perform all trading activities nowadays?

EXERCISE 12. Find words in the text which have a similar meaning to:

- a field
- goods
- mistakes
- to allow
- a vital aspect
- to pass information
- quick access
- computer-assisted
- to control

EXERCISE 13. Translate the following sentences from Russian into English.

1. Компьютер – важная часть всех сфер деятельности.
2. Компании используют возможности компьютера чтобы выполнить задачи быстро и эффективно.
3. Благодаря доступу в интернет компьютеры позволяют осуществлять продажу товаров по всему миру.
4. Успешное взаимоотношение с бизнес партнерами осуществляется в интернет пространстве.
5. Невозможно представить военную промышленность без компьютеризированных систем контроля.
6. В настоящее время вся информация о пациентах и их истории болезни хранится в электронных базах данных.
7. Компьютеризированные системы постановки диагноза позволяют быстрее выявить причину болезни.
8. Персонал медицинских учреждений использует компьютер и его возможности для постановки диагноза, хранения информации и оформления справок.
9. Внедрение обновленных систем управления и контроля значимо для оборонной промышленности.
10. Компьютеризированные и информационные технологии внедряются во все профессиональные области.

Speaking

EXERCISE 14. Answer the following questions.

1. Computers are now widespread, aren't they?
2. How old were you when you learnt about the computer?
3. Who uses computers today? Give examples of the impact computers have on our lives.
4. What are the reasons for buying home computers?
5. How often do you work with a computer?
6. Does good knowledge of English help to operate the computer better?

EXERCISE 15. Prove the following statements.

1. We are now living in the digital age.
2. Computers are very important for teaching and studying.
3. School sites can be useful for both parents and students.
4. Computers have radically changed banking.
5. Computers have radically changed traveling.

EXERCISE 16. Work in pairs and prepare a dialogue. Choose the topic of your conversation.

- 1) Student A has just bought a new mobile phone and is telling his friend about its functions. Student B is interested in the mobile phone's functions and asking questions about it.
- 2) Student A is interested in the model and has a lot of questions to a sales assistant about it. Student B is a sales assistant who can give professional advice about devices in the shop.

Writing

EXERCISE 17. Share your experience of using a computer. These questions will help you to clarify the way you can structure your text.

1. How often do you use a computer in your daily life?
2. What type of a computer is more convenient for you?
3. Do you use a computer for educational purposes? Give examples.
4. Does a computer help you to entertain yourself?
5. How often does your family use a computer? What for?
6. Can you imagine yourself using a computer for professional purposes at the moment?

Revision

EXERCISE 1. Choose the correct word or word combination to complete the sentence.

- 1) Young people who have grown up with PCs and mobile phones are often called the ____ generation.
A. digenous B. digital C. digging
- 2) A school website allows teachers to publish exercises for students to ____ online.
A. compete B. compel C. complete
- 3) Students can also enroll for ____ via the website and parents can download official reports.
A. cursors B. curses C. courses
- 4) ____ use projectors and interactive whiteboards to give presentations and teach sciences, history or language courses.
A. Airline pilots B. Travel agents C. Teachers
- 5) With a built-in camera you can send pictures and make video calls in face-to-face ____.
A. mold B. mode C. model
- 6) Computers control the cashpoints, which ____ money to customers.
A. disperse B. displace C. dispense

- 7) Using Chip and PIN cards makes transactions more _____.
A. profitable B. secure C. frequent

EXERCISE 2. Match the words and expressions with their definitions.

1. skills	a) the aim that someone wants to achieve, or that something is intended to achieve
2. to access	b) the ability to do something well, usually as a result of experience and training
3. to allow	c) a particular way of doing something
4. to complete	d) the action or process of buying or selling something
5. mode	e) safe from attack, harm, or damage
6. secure	f) to get information, especially from a computer
7. transaction	g) to give someone permission to do or have something
8. purpose	h) to finish something

EXERCISE 3. Put the words in the correct word order.

- basic / computers / to do / the Internet / use / research / to access / and / students /
- and / parents / reports / log on to / official / the school site / download /
- complete / via / online / the website / exercises / courses / students / and / enroll for /
- music and games / to store / mobile phones / emails / people / to send and receive / information / use / to play
- with / do / combine / new / a telephone / smartphones / what / ?
- to pay / from / and / your bills / use / it / the comfort / online banking / transfer money / of your home /
- controlled / also / or ATMs / computers / are / cashpoints / by /
- pilots / planes / airline / do / control / how / ?

EXERCISE 4. Translate the following sentences from Russian into English.

- Молодые люди выросли с компьютерами, которые стали важной частью их жизни.
- Для каких целей используются компьютеры?
- Что отображают мониторы?
- Студенты используют компьютеры для учебы и общения.
- Преподаватели размещают тесты, задания и упражнения, которые студенты делают онлайн.
- Родители заходят на сайт школы или университета и скачивают табели успеваемости.
- Сейчас есть Интернет-компании, которые предлагают языковые курсы онлайн.
- Некоторые люди записываются на бесплатные онлайн-курсы от ведущих университетов мира.
- «Курсера» это проект массового онлайн-образования.
- Оплачивать товары и услуги чиповой картой удобнее и безопаснее.

Unit II

What is a computer?

Warm-up

1. What is a computer?
2. Do you agree that everybody needs a computer? Why or why not?
3. What parts does a PC consist of?

Reading and Language Study 1

What is a computer?

A computer is an electronic machine which can accept data in a certain form, process the data, and give the results of the processing in a specified format as information.

First, data is fed into the computer's memory. Then, when the program is run, the computer performs a set of instructions and processes the data. Finally, we can see the results (the output) on the screen or in printed form.

A computer system consists of two parts: hardware and software. **Hardware** is any electronic or mechanical part you can see or touch. **Software** is a set of instructions, called a program, which tells the computer what to do. There are three basic hardware sections: **the central processing unit (CPU), main memory and peripherals.**

Perhaps the most influential component is the central processing unit. Its function is to execute program instructions and coordinate activities of all the other units. In a way, it is the 'brain' of the computer. The main memory (a collection of RAM chips) holds the instructions and data which are being processed by the CPU. Peripherals are the physical units attached to the computer. They include storage devices and input/output devices.

Storage devices (hard drives, DVD drives or flash drives) provide a permanent storage of both data and programs. **Disk drives** are used to read and write data on disks.

Input devices enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

In the **rear panel** of the computer there are several ports into which we can plug a wide range of peripherals – a modem, a digital camera, a scanner, etc. They allow communication between the computer and the devices. Modern desktop PCs have USB **ports** and memory card readers on the **front panel**.

EXERCISE 1. Scan the text and find definitions to these terms:

- A computer
- Hardware
- Software
- CPU
- Peripherals
- Storage devices

EXERCISE 2. Read the text and answer the questions.

- 1) What is a computer?
- 2) How does a computer process the data.
- 3) What does hardware system consists of?
- 4) What function does the CPU have?
- 5) What function does the main memory have?
- 6) What do peripherals include?
- 7) Why does a computer need input devices?
- 8) Why does a computer need output devices?
- 9) What is a USB connector?
- 10) Find two types of the computer's panels.

EXERCISE 3. Read the statements and say whether they are true (T) or false (F). Correct the false ones.

- 1) The main part of a computer is a monitor.
- 2) A keyboard is an output device.
- 3) Hardware is any mechanical part of a computer system.
- 4) There are 2 basic hardware sections.
- 5) The main memory hold instructions and data which are processed by the CPU.
- 6) CPU means central protecting unit.
- 7) Software is a set of peripherals.
- 8) Input devices enable data to go out of the computer.
- 9) Disk drive is an example of storage device.
- 10) USB ports allow communication between a computer and flash memory.

EXERCISE 4. Read the text carefully and complete the sentences given below.

- 1) A computer is an _____ machine which can accept _____ in a certain form, process the data, and give the results of the processing in a specified format as _____.
- 2) A computer system consists of two parts: _____ and _____.
- 3) Hardware is any electronic or mechanical part you can _____ or _____.
- 4) Software is a set of _____, called a program.
- 5) CPU is the _____.
- 6) CPU's function is to _____ program instructions and _____ activities of all the other units.
- 7) The main memory consists of a collection of _____.
- 8) The physical units attached to the computer are called _____. They include storage devices and _____ devices.
- 9) Hard drives provide a _____ storage of data and programs.
- 10) Input devices enable data to go _____ the computer's memory. Output devices enable us to _____ the finished product from the system.

EXERCISE 5. Find words in the text which have a similar meaning to:

- To receive data
- To enter
- Results of a computer
- Important part
- To carry out
- To control

- Parts of a computer
- To connect
- Constant
- To allow
- To take from the system
- The back panel

EXERCISE 6. Match these words to make collocations from the text. Make up sentences using these word combinations.

- | | |
|---------------------------|--|
| 1. software | a) the brain of the computer |
| 2. peripherals | b) physical parts that make up a computer system |
| 3. main memory | c) programs which can be used on a particular computer system |
| 4. hard drive (hard disk) | d) the information which is presented to the computer |
| 5. hardware | e) results produced by a computer |
| 6. input | f) input devices attached to the CPU |
| 7. ports | g) section that holds programs and data while they are executed or processed |
| 8. output | h) magnetic device used to store information |
| 9) CPU | i) sockets into which an external device may be connected |

EXERCISE 7. Fill in the table using the terms and make your sentences.

USB ports Charging circuit Earphones ports

Memory card reader DVD drive Speakers ports

Rear panel of a computer	The front panel of a computer	Both side panels of a laptop

- 1) There is/ there are _____ rear panel of a computer.
- 2) There is/ there are _____ the front panel of a computer
- 3) There is/ there are _____ both side panels of a laptop

EXERCISE 8. Find in the text the English equivalents for these Russian terms and expressions.

- 1) Электронная техника
- 2) Принимать данные
- 3) Обрабатывать данные
- 4) Память
- 5) Набор инструкций
- 6) Программное обеспечение
- 7) Техническое обеспечение

- 8) Состоять из
- 9) Выполнять инструкции
- 10) Управлять работой всех частей компьютера
- 11) Подсоединенный к
- 12) Включать
- 13) Постоянное хранение данных
- 14) Выдать продукт
- 15) Вставить/подсоединить кабель

EXERCISE 9. Look at the BOX and then use suitable expressions to complete the sentences.

- _____ include(s)_____.
- _____ consist(s) of _____.
- _____ consist(s) of _____.
- There is/are_____.
- _____ can be divided into _____.
- _____ are classified into _____.

- 1) A computer _____ hardware and software.
- 2) Hardware _____: _____, _____, _____.
- 3) _____ many available programs nowadays.
- 4) Peripherals _____ three types: input, output and storage devices.
- 5) Storage devices _____ into _____.
- 6) _____ some output devices such as _____, _____, _____.
- 7) A word processing program _____ software which lets the user create and edit texts.
- 8) _____ types of network architecture: peer-to-peer, where all computers have the same capabilities, and client-server (e.g. the Internet), where servers store and distribute data, and clients access the data.

Speaking

EXERCISE 10. Answer the following questions.

- 1) What unit coordinates the operation of all computer parts?
- 2) What unit allows to connect a printer and the CPU?
- 3) What unit holds the instructions and data?
- 4) What unit provides a permanent storage of data and programs?
- 5) What unit lets extract the finished product from the computer?
- 6) What unit allows to read and write data on disks?

EXERCISE 11. Prove the following statements.

1. A computer is a set of electronic devices.
2. The most influential component of a computer is the central processing unit.
3. Input and output devices are necessary parts of a computer.

EXERCISE 12. Work in pairs and prepare a dialogue. Choose the topic of your conversation.

Your company is considering replacing all the office PCs with laptops.

- 1) Student A is very interested in the benefits and has a lot of questions to a sales assistant about it.

Student B is a sales assistant explaining the benefits for the employees and the company.

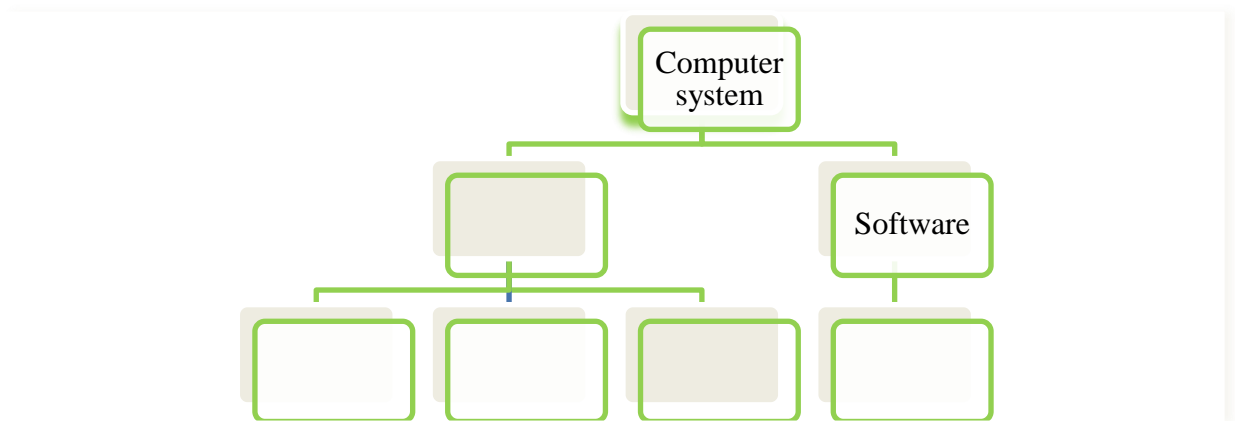
- 2) The directory of your university is considering buying laptops or tablets for all students.

Student A is interested in the benefits of these devices and has a lot of questions to a sales assistant about them.

Student B is a sales assistant explaining the benefits for the students and the University.

Writing

EXERCISE 13. Fill in the chart and describe it using all the necessary expressions. Make reference to your own device.



Reading and Language Study 2

Types of computers

A computer is an electronic device that accepts data, processes it, stores, and then produces an output. There are different computer types available depending on the number of users they can support at any one time, their size, and power. The four basic types of computers are supercomputers, mainframe computers, minicomputers, microcomputers.

Supercomputer

The most powerful computers in terms of performance and data processing are the supercomputers. These are specialized and task specific computers used by large organizations. These computers are used for research and exploration purposes, like NASA uses supercomputers for launching space shuttles and controlling them. The supercomputers are very expensive and very large in size. It can be accommodated in large air-conditioned rooms; some super computers can span an entire building.

Mainframe computer

Although mainframes are not as powerful as supercomputers, but certainly they are quite expensive nonetheless. Many large firms and government organizations use mainframes to run their business operations. The mainframe computers can be accommodated in large air-conditioned rooms because of its size. Super-computers are the fastest computers with large data storage

capacity. Mainframes can also process and store large amount of data. Banks, educational institutions and insurance companies use mainframe computers to store data about their customers, students and insurance policy holders.

Microcomputer

Desktop computers, laptops, gaming consoles, calculators, sound and navigation system of a car, personal digital assistant (PDA), tablets and smartphones are all types of microcomputers. The micro-computers are widely used and the fastest growing computers. These computers are the cheapest among the other three types of computers. The micro-computers are specially designed for general usage like entertainment, education and work purposes. Well known manufacturers of micro-computer are Dell, Apple, Samsung, Sony & Toshiba.

EXERCISE 14. Read the text “Types of Computers” and check the meaning of these words and phrases:

- task-specific computers
- accommodated in large air-conditioned rooms
- data storage capacity
- large amount of data
- insurance companies
- designed for a single user
- support users
- be widely used
- designed for general usage
- well known manufacturers

EXERCISE 15. Fill in the table and describe it using all the necessary expressions.

Type of a computer	Supercomputer	Mainframe	Microcomputer
Size	large		
Performance			
Functions			
Data storage capacity			
Accommodation conditions			
Areas of use			

EXERCISE 16. Translate the following sentences from Russian into English.

- 1) Все современные модели компьютеров различаются между собой по многим параметрам - габаритам, функционалу, возможностям, техническим характеристикам, а также назначению.
- 2) Наиболее распространенным типом вычислительной техники по праву считаются персональные компьютеры.
- 3) Персональный компьютер (ПК) — это микрокомпьютер, спроектированный для использования отдельным человеком.
- 4) Ноутбук— это вид портативного компьютера с встроенным дисплеем, клавиатурой, курсором (вместо мыши).
- 5) Даже несмотря на то, что ноутбуки существенно компактней и мобильней, чем стационарные компьютеры, они так же разделяются между собой по габаритам и весу.

- 6) Настольный компьютер - стационарный персональный компьютер, предназначенный в первую очередь для работы в офисе или в домашних условиях.
- 7) Нетбук - ноутбук с маленьким экраном и относительно невысокой производительностью, предназначенный для выхода в Интернет и работы с офисными приложениями. Отличается компактными размерами, небольшим весом, низким энергопотреблением и относительно невысокой стоимостью.
- 8) Нетбуки отлично подходят для тех людей, которые любят работать не только за определенным рабочим местом, но и в дороге, то есть в процессе поездки, в ресторане или в машине.
- 9) Сегодня компьютеры применяются для решения многочисленных и разнообразных задач, таких, как обработка текста, графика и переработка больших массивов информации.
- 10) Планшеты весят значительно меньше ноутбуков и даже нетбуков.
- 11) Существуют два основных типа компьютеров: аналоговые и цифровые.
- 12) Программное обеспечение представляет собой совокупность компьютерных инструкций. Оно охватывает программы, подпрограммы (разделы программы) и данные. Таким образом, программное обеспечение указывает компьютеру, что делать, как, когда, в какой последовательности и как часто.
- 13) Мейнфреймы применяются на крупных предприятиях, где требуется организация бесперебойной работы с вводом-выводом и обработкой больших данных (например, продажа билетов, обслуживание платёжных терминалов и т. п.), в банковских системах, в системах управления и т.д.
- 14) Суперкомпьютеры - это класс компьютеров, представляющий собой очень мощные устройства, с максимально высокой производительностью, предназначенные для выполнения специфических задач и расчётов, моделирования процессов в разных областях науки и техники, проведения биржевых операций.

Revision

EXERCISE 1. Choose the correct word or word combination to complete the sentence.

- 1) The computer shows the _____ on the monitor.
A. images B. input C. output
- 2) In the rear panel of the computer there are several ports into which we can plug a wide range of _____.
A. cursors B. peripherals C. RAM chips
- 3) People think that the most _____ component of a computer is the CPU.
A. available B. secure C. influential
- 4) There are three basic hardware _____: the CPU, main memory and peripherals.
A. sections B. ideas C. functions.
- 5) The main memory _____ the instructions and data which are being processed by the CPU.
A. processes B. accepts C. holds.
- 6) Peripherals are the devices - _____ to the computer.
A. showed B. transferred C. attached
- 7) Output devices _____ us to extract the finished product from the system.
A. enable B. displace C. dispense

EXERCISE 2. Translate the words in the right column into English and the words in the left column into Russian.

1. The rear panel		1. Порт
2. The front panel		2. Программное обеспечение
3. Central processing unit		3. Техническое обеспечение
4. Keyboard		4. Видеокарта
5. A Flash drive		5. Карт -ридер
6. Mother board		6. Розетка/гнездо/разъем
7. Peripherals		7. Электронная техника
8. Storage device		8. Флешка

EXERCISE 3. Match the words to find synonyms.

1) to perform a set of instructions	a) To attach/ to connect
2) to plug into	b) To execute
3) to consist of	c) To coordinate the operation
4) to control the work	d) To receive data
5) to accept data	e) To keep
6) to store the data	f) To include

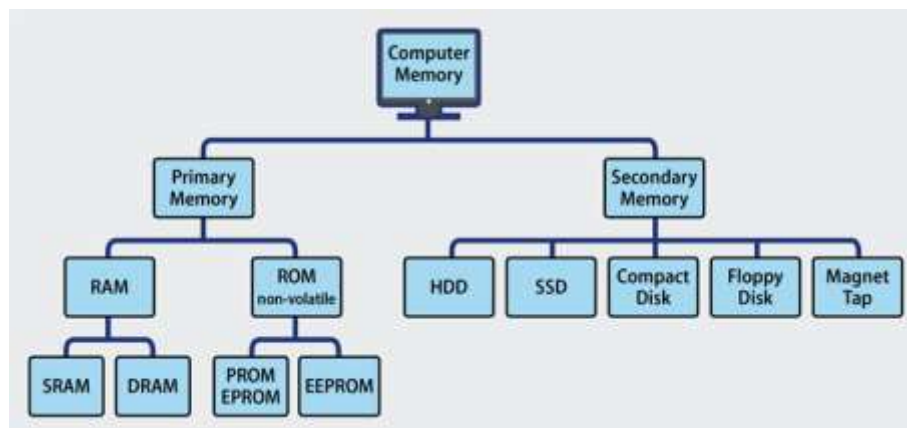
EXERCISE 4. Put the words in the correct word order.

- 1) performs / a set / and / the computer /of / the data / instructions / processes/
- 2) parts /a / of / consists/ hardware/ and / two / computer system/ software.
- 3) function / to execute / is/ program / instructions/ of / the CPU.
- 4) data / on/ disks/ disk/ to read /drives / are used / and /write.
- 5) ports / there are/ memory card / the front and rear panels / several /and / readers/ on .

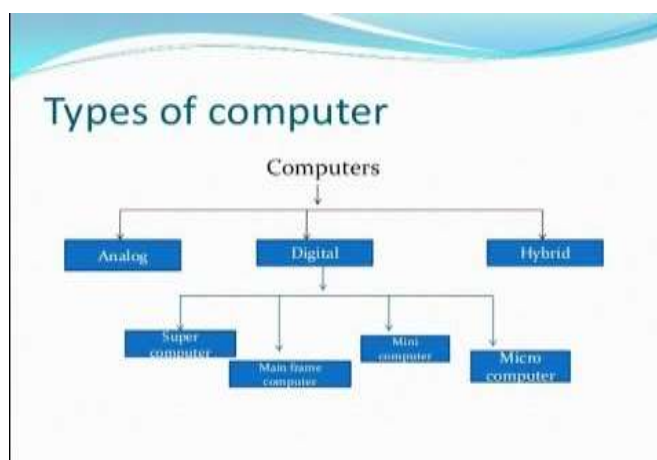
EXERCISE 5. Choose the chart and describe it using all the necessary expressions. Make reference to your own device.

- ✓ _____ include(s)_____.
- ✓ _____ consist(s) of_____.
- ✓ There is/are_____.
- ✓ _____ can be divided into _____.
- ✓ _____ are classified into_____.

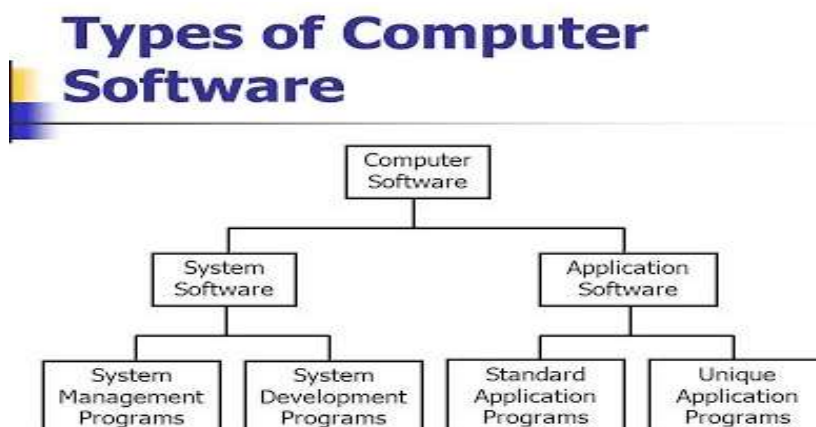
1.



2.



3.



EXERCISE 6. Translate the following sentences from Russian into English.

- 1) Компьютер – электронно-вычислительная машина, способная выполнять определённую последовательность операций.
- 2) Компьютер состоит из системного блока и периферийных устройств (монитор, мышь, клавиатура и т.п.).
- 3) В системном блоке расположены: блок питания, жесткий диск, материнская плата, оперативная память, звуковая карта, видео карта, сетевая карта, дисковод и другие комплектующие, которые необходимы для расширения возможностей.
- 4) Процессор обеспечивает и вычисляет все операции на компьютере.

- 5) Оперативная память - это маленькая плата необходимая для хранения временных данных. Когда вы что-то копируете, эта информация временно хранится на оперативной памяти.
- 6) Видеокарта позволяет передавать изображения с компьютера на экран/монитор. Она вставляется в материнскую плату в свой разъем.
- 7) Жесткий диск хранит всю информацию и файлы, в том числе операционную систему, программы, браузеры, фото, музыку и т.д.
- 8) Если вам необходимо скопировать информацию с диска, тогда вам понадобится дисковод. Но на современных компьютерах уже редко встретишь дисковод.
- 9) В настоящее время все пользователи хранят данные на флешках.
- 10) На боковых панелях ноутбука есть USB порты, карт-ридеры и др.

Unit III

IT professionals

Warm-up

1. What qualification are you going to get after graduating from the university?
2. Make a list of the jobs you know in ICT. Try to write down as many jobs as you can.
3. Compare your lists with other students in your group.

Reading and Language Study

IT professionals

Most ICT-related jobs need to analyze, design, develop, manage or support computer software, hardware or networks. The main requirements for being a good programmer are nothing more than a good memory, an attention to detail, a logical mind and the ability to work through a problem. All the people involved in the different stages of development of a computer project, i.e. analysts, programmers, support specialists, etc. are controlled by a project (or IT) manager.

IT managers manage projects, technology and people. Any large organization will have at least one IT manager who is responsible for the maintenance of servers and the installation of new software, and for staffing a help-desk and a support group.

Systems Analyst studies methods of working within an organization to decide how tasks can be done efficiently by computers. He takes a detailed analysis of the employer's requirements and work patterns to prepare a report on different options for using information technology. This may involve consideration of hardware as well as software. He either uses standard computer packages or writes a specification for programmers to adapt existing software or to prepare new software. Also, he may oversee the implementation and testing of a system and acts as a link between the user and the programmer.

Computer Systems Analyst Programmer creates the software programs used by computers. He may specialize in the internal operating systems using low level computer language, or in applications programs. May specialize in one aspect of the work, e.g. programming, systems design, systems analysis, or cover them all. His job involves supporting the system through advice and training, providing user manuals, and helping users with any problems that arise.

Application Programmer writes the programs which enable a computer to carry out particular tasks. He may write new programs or adapt existing programs, modify computer packages to meet the needs of an individual company. Application Programmer also checks programs for faults and does extensive testing.

Hardware Engineer researches, designs, and develops computers, or parts of computers and the computerized element of appliances, machines, and vehicles. Also he is involved in their manufacture, installation, and testing. He may specialize in different areas: research and development, design, manufacturing. He has to be aware of cost, efficiency, safety, and environmental factors, as well as engineering aspects.

Software Engineer/Designer produces the programs which control the internal operations of computers. He converts the system analyst's specification to a logical series of steps, translates these into the appropriate computer language. He designs, tests, and improves programs for computer-aided design and manufacture, business applications, computer networks, and games.

Software testers are involved in the quality assurance stage of software production. They conduct tests to ensure the software has no errors before software is passed to everyday users. Typical responsibilities of a tester include monitoring applications and software systems, writing bug reports (errors reports), reviewing documentation, providing objective feedback to software development project teams.

Computer Salesperson advises potential customers about available hardware and sells equipment to suit individual requirements. He discusses computing needs with the client to supply a suitable system. He is responsible for organizing the sale and delivery and, if necessary, installation and testing. He may arrange support or training, maintenance, and consultation. He must have sufficient technical knowledge.

Computer Systems Support Person is responsible for maintaining, updating, and modifying the software used by a company. Some support people specialize in software which handles the basic operation of the computers. This involves the use of machine codes and specialized low-level computer languages. They may sort out problems which users encounter. Solving problems may involve amending an area of code in the software, retrieving files and data lost when a system crashes.

Network Support Person maintains the link between PCs and workstations connected in a network. He uses telecommunications, software, and electronic skills, and knowledge of the networking software to locate and correct faults. This may involve work with the controlling software, on the wiring, printed circuit boards, software or microchips on a file server, or on cables either within or outside the building.

Changing technology is one reason computer professionals will continue to be in demand in the future.

EXERCISE 1. Scan the text and find descriptions of these terms:

- An IT manager
- A systems analyst
- A software engineer
- A software tester
- A hardware engineer
- A Computer Systems Support Person
- Network Support Person

EXERCISE 2. Read the text and answer the questions.

- 1) Who is involved in coordinating of different stages of Software development?
- 2) What responsibilities does a Systems Analyst have?
- 3) What specialist act as a link between a user and a programmer?
- 4) What specialist can solve computer problems in a company?
- 5) What responsibilities does a Software Engineer and a Software tester have?
What knowledge should he/she have?
- 6) What responsibilities does a Computer Salesperson have?

- What knowledge should he/she have?
- 7) What responsibilities does a Hardware Engineer have?
What knowledge should he/she have?
 - 8) What responsibilities does a Network Support Person have?
 - 9) Which professionals work with end-users?
 - 10) Why will computer professionals continue to be in demand in the future?

EXERCISE 3. Read the statements and say whether they are true (T) or false (F). Correct the false ones.

1. A computer salesperson organizes the sale and delivery of a computer system but doesn't install and test it.
2. A software engineer makes up a complete systems program combining programs compiled from libraries.
3. A computer systems analyst programmer specializes only in one aspect of the work, e.g. programming, systems design or systems analysis.
4. A software engineer is the only person in a company who is responsible for the quality assurance stage of software production.
5. A network support person sometimes works outside.

EXERCISE 4. Classify these jobs under the heading that best describes their function.

software engineer, help desk technician, database administrator, a supervisor, network analyst, systems analyst, hardware engineer, network administrator, a senior programmer.

analyze	design/develop	manage	support

EXERCISE 5. Find words in the text which have a similar meaning to:

- To oversee
- To adapt
- Requirements
- To consult
- To know
- To produce (programs)
- To amend
- To correct faults
- A client

EXERCISE 6. Complete the sentences given below and translate them into Russian.

- 1) A software engineer _____ the system analyst's specification ____ a logical series of steps.
- 2) A computer sales person _____ potential customers ____ available hardware.
- 3) Hardware engineers may _____ ____ different areas, research and development, design, manufacturing.
- 4) A computer systems analyst programmer may _____ the system _____ advice and training, providing user manuals and so on.
- 5) Systems support people are _____ ____ maintaining, updating and modifying the software used by a company.

- 6) Hardware engineers should be _____ cost, efficiency, safety, environmental factors and engineering aspects.

EXERCISE 7. Read the text carefully and complete the sentences given below.

E.g. _____ organizes the sale, delivery of Software. - Computer Salesperson

- 1) _____ produce the program.
- 2) _____ sell equipment.
- 3) _____ design parts of a computer.
- 4) _____ work with wiring, printed circuit board, microchips on a file server, or on cables.
- 5) _____ amend an area of code in the software.
- 6) _____ retrieve files and data lost when a system crashes.
- 7) _____ write specification of company's software for programmers.
- 8) _____ install hardware.
- 9) _____ advise and help users.
- 10) _____ locate and correct faults.
- 11) _____ develop parts of a computer.
- 12) _____ maintain the link between a PC and workstation connected in a network.
- 13) _____ know (to be aware of) engineering aspects.
- 14) _____ oversee the implementation and testing of a system.
- 15) _____ act as a link between the user and the programmer.
- 16) _____ test computer systems.
- 17) _____ provide manuals to users.

EXERCISE 8. Read these descriptions of jobs in computing and make notes about the main responsibilities.

Job	Main responsibilities
Systems analyst	Studies employer's requirements and working patterns. Reports on different options. Writes specifications for programmers. Oversees implementation and testing.

EXERCISE 9. Find in the text the English equivalents for these Russian terms and expressions.

- 1) Эффективно выполнять задачи
- 2) Делать детальный анализ
- 3) Требования работодателя
- 4) Подготовить отчет
- 5) Писать спецификацию для программистов
- 6) Предоставить пользователям инструкции
- 7) Адаптировать программное обеспечение
- 8) Анализ системы
- 9) Компьютеризированные элементы приборов
- 10) Установка и тестирование аппаратного обеспечения
- 11) Исследование и разработка
- 12) Стоимость, производительность и безопасность
- 13) Факторы окружающей среды
- 14) Конвертировать
- 15) Логическая последовательность шагов
- 16) Соответствующий компьютерный язык
- 17) Создание и тестирование систем

- 18) Улучшать программы
- 19) Уверенность в качестве
- 20) Консультировать клиентов
- 21) Индивидуальные требования
- 22) Продавать оборудование
- 23) Поставлять соответствующие компьютерные системы
- 24) Организовывать продажу и доставку
- 25) Поддержка, ведение и консультирование
- 26) Достаточные технические знания
- 27) Ведение, обновление и модификация программного обеспечения
- 28) Специализироваться в программном обеспечении
- 29) Низкоуровневые компьютерные языки
- 30) Восстановление файлов
- 31) Корректировать ошибки
- 32) Потерянные данные
- 33) Сбой системы
- 34) Электронные навыки
- 35) Обнаружить и устранить неисправности
- 36) Выявлять и решать проблемы

EXERCISE 10. Match these words to make collocations from the text. Make up sentences using these word combinations.

1. To be responsible	a) of cost of efficiency of safety of engineering aspects
2. To specialize	b) in development in research in manufacturing in testing
3. To be aware	c) amending supporting providing helping
4. To be involved	d) for maintaining for installation for organizing for updating
5. To involve	e) in software in programming in applications programs in systems analysis

EXERCISE 11. Match the following words and word combinations (1-6) with their definitions (a-f).

1. manual	a) a detailed description of what a job involves
2. deadline	b) a date or time by which you have to do or complete something
3. job specification	c) change into something completely different, or to make something change in this way
4. maintain	d) a book that gives instructions about how to do something, especially how to use a machine
5. edit	e) use something for a particular purpose
6. utilize	f) make sure that something stays at the same level, condition, rate, or standard

EXERCISE 12. A) Study the suffixes for job in LANGUAGE BOX below.

LANGUAGE BOX		
Suffixes for job		
-er	<i>webmaster</i> <i>manufacturer</i> <i>publisher</i>	Prospective <i>webmasters</i> may also learn the job by taking a basic adult education course in Web design.
-eer	<i>engineer</i> <i>auctioneer</i>	The U.S. Bureau of Labor Statistics projects that jobs for <i>software developers</i> will grow by 22% from 2012 to 2022
-or	<i>animator</i> <i>operator</i>	Video game <i>animators</i> combine art and technology to create interactive animated images and environments for video games.
-ant	<i>IT consultant</i> <i>IT assistant</i>	She's a computer consultant and specializes in e-commerce, data protection and IT strategies.
-ician	<i>technician</i> <i>electrician</i>	A computer <i>technician</i> installs, troubleshoots and upgrades hardware and software.
-ist	<i>typist</i> <i>scientist</i>	<i>Typists</i> are administrative workers who prepare documents, such as letters and reports, for other business professionals.

B) Which IT professionals from the LANGUAGE BOX are described below?

- ✓ a person who designs and maintains software applications;
- ✓ a person who gives expert, professional advice;
- ✓ a person who uses graphics software to make or edit animated pictures;
- ✓ a person who is employed to type letters, reports and other documents;
- ✓ a person or enterprise that produces goods in large numbers, using machines;
- ✓ a specialist in the technical details of computers.

EXERCISE 13. Complete the sentences with the jobs from the box.

<i>software engineer</i>	<i>hardware engineer</i>	<i>help desk technician</i>	<i>blog administrator</i>
<i>computer security specialist</i>	<i>webmaster</i>	<i>DTP operator</i>	<i>network administrator</i>

- 1) A _____ designs and develops IT devices.
- 2) A _____ writes computer programs.
- 3) A _____ edits and deletes posts made by contributors to a blog.
- 4) A _____ uses page layout software to prepare electronic files for publication.
- 5) A _____ manages the hardware and software that comprise a network.
- 6) A _____ designs and maintains websites.
- 7) A _____ works with companies to build secure computer systems.
- 8) A _____ helps end-users with their computer problems in person, by email or over the phone.

EXERCISE 14. Complete the table using the information from the text and your own ideas. The following words and expressions could help you:

ambitious; clever; creative; strong-willed; persistent; just; punctual; resolute; smart; tactful; logical mind; logical reasoning, qualified; have experience in this kind of job; communicative; be able to earn the trust of the team; being good with figures, patient, self-disciplined, accurate, efficient, have leadership skills, creative, drawing skills

job title	abilities and qualities
IT manager	
Systems Analyst	
Software Engineer/Designer	
Network Support Person	
Computer Salesperson	
Computer Systems Support Persons	
Hardware Engineer	

EXERCISE 15. Insert the prepositions to complete the sentences.

- 1) A systems programmer is a person who specializes _____ writing systems software (a program or set of programs that are used to control the basic functions of a computer system e.g. operating system programs).
- 2) IT professionals should be aware _____ the tools used to migrate applications, data and configuration settings to mobile devices and smartphones.
- 3) Administrators are responsible _____ technological configuration, monitoring, testing, analyzing, reporting, making database and software backups, updates, archiving data and so on.
- 4) IT specialists can work _____ different teams according to their specific duties under the control of a corresponding supervisor.
- 5) A help-desk troubleshooter is a person who works as part of a telephone service that helps users _____ computer problems.
- 6) Ability to work _____ a team and to tight deadlines is vital.
- 7) You will be involved _____ the full range of software development activities - analysis, design, coding, testing, debugging and implementation.

- 8) Creativity and critical thinking are the most important skills _____ a Web designer.
- 9) PromoPrint is a company specializing _____ publishing catalogues and promotional material.
- 10) They help to sort _____ different problems which end users experience.

EXERCISE 16. A) Study the modal verbs in LANGUAGE BOX below.

LANGUAGE BOX	Job requirements
<p>We can describe essential requirements for particular jobs in the following ways:</p> <ul style="list-style-type: none"> - IT managers have to take responsibility for budgets. - You must have a diploma in computing. - You need to be able to empathise with the person at the other end of the phone. 	<p>We can describe desirable requirements like this:</p> <ul style="list-style-type: none"> - You should have an interest in technology. - You should be physically fit. <p>We can describe things which are not requirements like this:</p> <ul style="list-style-type: none"> - You don't need to have a degree in computing science.

B) Fill in the blanks with the appropriate form of the verbs: *should, need to, have to and must, to make sensible statements. More than one answer is possible in some examples.*

- 1) A computer salesperson _____ have sufficient technical knowledge.
- 2) Technical writers _____ have computer proficiency and excellent interpersonal communication skills.
- 3) A computer systems support person _____ be able to sort out problems encountered by users.
- 4) Software developers _____ have Bachelor's degree in Mathematics, Computer Science, Computer Engineering or Information Systems.
- 5) If you want to work as a technical writer, you _____ have a diploma course in technical writing or journalism or mass media communications.
- 6) A computer network support person _____ have deductive ability for analysing faults.
- 7) A computer technical salesperson _____ be patient, persistent and diplomatic.
- 8) Website developers _____ be able to work under pressure.
- 9) A hardware engineer _____ be aware of cost, efficiency, safety, as well as engineering aspects.
- 10) Systems analyst _____ make a detailed analysis of the employer's requirements and work patterns to prepare a report on different options for using information technology.

EXERCISE 17. Open the brackets. Mind the tenses.

- 1) Though you (not can) know everything you (must, to be) an expert in your own field.
- 2) A consultant often (to have to) work on very small timescales- a few days here, a few days there.
- 3) He (to need, to be) better if he wants to apply for this job.
- 4) Any large organization (must) have at least one IT manager.
- 5) You (not must) set up any password system on this computer.
- 6) You (must, to spend) lots of time writing this program- it's very complicated.
- 7) You (not to need) have any previous work experience.
- 8) A system analyst (to have to) study systems in an organization and decide how to computerize them.
- 9) Production of special programs which control the internal operations of computers (to be) very necessary and essential nowadays.

EXERCISE 18. Use the appropriate modal verbs to complete the sentences.

- 1) A webmaster ...administer a Web server.
- 2) An applications programmer is a person who ...write applications programs.
- 3) You ...be extremely qualified if you ...create such programs.
- 4) A security specialist ...a useful qualification for your career.
- 5) You ... attempt to gain unauthorized access to network systems.
- 6) If you ...show someone an impressive piece of software with your name on it, it will count a lot more than a string of academic qualifications.
- 7) Though university degrees ...rather essential still they are sometimes useless.
- 8) You ... stay in one company for more than two years.
- 9) You ... expect much if you don't practice a lot.
- 10) You ...be bright, communicative and to be able to earn the trust of your team.

Speaking

EXERCISE 19. Work in pairs. Choose one of the computing careers. Your partner must find out what your job is by asking only Yes/No questions. Your partner cannot ask 'Are you a software engineer?'

EXERCISE 20. Work in groups.

- A) *Prepare a report about one of the professions below and share the information with other students from your group to complete the table for each of the occupations.*

Job title	Nature of work	Duties and responsibilities	Skills and specifications	Education and qualification requirements
Blog administrator				
Desktop publisher				
Website developer				
Software tester				
3D animator				

B) Choose any IT job, and make the presentation on the responsibilities, specifications, and education and qualification requirements for this job. Report back to your group.

C) Think about all IT professions. Make the presentation on common and different aspects of IT professions?

Writing

EXERCISE 21. Write about your future job, its main features and responsibilities. What skills should you have? What personal qualities should you have? What professional abilities are required for your future job? What perspectives do you expect?

Revision

EXERCISE 1. Read this team introduction. Complete the descriptions 1-4 with the IT jobs in the box.

Hi! I'm Sylvia. I create usernames and passwords and I set firewalls. This is Isabelle. Her job is to plan and design the network. And this is Andrew. His job is to make sure all of the computers work properly. Finally, Mark and Latika. Their area is data processing. We all work for the university. Our offices are in building 8.

database analyst	network administrator
IT support officer	network architect

- 1) Sylvia is a ...
- 2) Isabelle is a ...
- 3) Andrew is an ...
- 4) Mark and Latika are...

EXERCISE 2. Match 1-4 with a-d to make true sentences about jobs.

1. A technical designer	a) controls all the operations and people in a project.
2. A project writer	b) designs applications against viruses.
3. A web specialist	c) writes documentation of a program or device.
4. A security manager	d) plans and keeps websites updated.

EXERCISE 3. Complete the sentences with the jobs from the box.

help desk technician	database analyst	website administrator	IT security analyst
software developer	hardware engineer	information analyst	application support specialist

1. A _____ works mainly with the physical aspects of computers, from planning the concept for the system to manufacturing the parts for installation.
2. A _____ uploads images, articles, photographs, videos, audio files to accompany websites and weblogs; creates daily backup files, tests page-navigation links, moderates blog comments, responds to email requests.
3. A _____ ensures proper computer and software operation, assists end users when problems occur, so that the end users can accomplish business tasks.
4. An _____ is in charge of the support and administration of applications and services used for the production, management and delivery of content and services online.
5. A _____ is responsible for the electronic information that is found on computer systems in order to carry out the data requirements of the clients. He/she must ensure that the information is understandable and accurate.
6. An _____ identifies the existence and source of any security breaches, monitors a company's computer network, and resolves security problems as quickly as possible.
7. A _____ is responsible for creating, installing, maintaining, debugging and updating a software product.

8. An_____ is in charge of designing and managing information systems, as well as analyzing and tracking data needed to facilitate company projects and various operations.

EXERCISE 4. Read the statements and say whether they are true (T) or false (F). Correct the false ones.

1. A Computer Salesperson solves software problems in a company.
2. A Systems Analyst maintains, update, modifies the software in a company.
3. A Systems Analyst makes a detailed analysis of company's computers work.
4. A Help desk technician edits and deletes posts made in a blog.
5. A DTP operator uses pages layout software to prepare electronic files for publication.
6. A Systems Analyst designs and maintain websites
7. Hardware Engineer assist the end-users with their computer problems by e-mail or over the phone.
8. A Hardware Engineer manufactures, installs and tests parts of a computer.
9. A Computer security specialist builds secure computer systems.
10. A Webmaster acts as a link between the user and the programmer.
11. A Software Engineer retrieves files and data lost when a system crashes.

EXERCISE 5. Translate the following sentences from Russian into English.

- 1) Айти-специалисты делятся на тех, кто занимается компьютерным оборудованием и тех, кто занимается программным обеспечением для компьютеров. Первые — системный администратор, инженер-разработчик компьютерного оборудования и другие. Ко вторым относятся программист, разработчики сайта и другие.
- 2) Системные администраторы следят за тем, чтобы вся компьютерная техника и программное обеспечение в офисе работали слаженно. Иногда они занимаются информационной безопасностью.
- 3) Веб мастера занимаются разработкой и поддержанием работы сайтов. То есть если организация или частное лицо хочет иметь собственный сайт, необходим именно веб-мастер.
- 4) Крайне востребованными АйТи специалистами являются специалисты в области защиты информации. Защита информации нужна каждому банку, каждой фирме, каждому госпредприятию.
- 5) Администратор базы данных отвечает за работу и сохранность базы данных. Этот IT специалист зачастую сам разрабатывает требования к базе данных, сам ее проектирует и в дальнейшем отвечает за эффективное использование и сопровождение базы. Базы данных есть во всех крупных организациях: от сетевых магазинов до банков и государственных структур.
- 6) Разработчик видеоигр - это специалист, который разрабатывает программное обеспечение для видеоигр. Разработчик игр может работать самостоятельно, а может трудиться и в большой специализированной компании. Разработчик видеоигр должен уметь немало, особенно если он сам занимается и созданием программного кода игры, и ее визуализацией, и дизайном. Ему постоянно нужно освежать знания, поскольку игровая индустрия постоянно развивается.
- 7) Специалист-тестировщик занимается тестированием компонента или системы. В его обязанности входит поиск вероятных ошибок и сбоев в функционировании продукта или программы.
- 8) Специалисты по UX (User eXperience) следят за тем, чтобы продукт стал максимально удобным и легким для пользователя. Эксперт должен провести качественный анализ

конечного результата работы программистов и разработчиков продукта. Им нужно выяснить, соответствует ли продукт ожиданиям и требованиям заказчика.

- 9) Системный аналитик отвечает за выбор методологии разработки, создание или выбор фреймворков, именно он принимает решение о том, когда следует воспользоваться готовым программным кодом, а когда заняться его самостоятельной разработкой. Кроме того, он пишет описание и прочие документы для будущего программного продукта и планирует сроки разработки.
- 10) Инженеры-программисты несут ответственность за разработку, проектирование, производство и тестирование разнообразных программных продуктов. Инженеру необходимо высшее образование.

Unit IV

Information security specialists

Warm-up

1. Do you agree that personal information should be protected?
2. What professionals should provide a company with protection of its information?
3. How can a company keep its confidential data protected?

Reading and Language Study

Cyber Security Engineer

Boston, MA USA

Full Time Mid-level / Intermediate

@BostonChildrens LinkedIn Website

Boston Children's Hospital

At Boston Children's Hospital, success is measured in patients treated, parents comforted and teams taught. It's in discoveries made, processes perfected, and technology advanced. In major medical breakthroughs and small acts of kindness. And in colleagues who have your back and patients who have your heart. As the teaching hospital of Harvard Medical School, our reach is global and our impact is profound. Join our acclaimed Information Security team and discover how your talents can change lives. Yours included.

This Cyber Security Engineer III will be responsible for:

- Working as a member of a cyber security team, develop and deploy efficient protection of system, networks, software, data and information systems against any potential attacks.
- Conducting security assessments through vulnerability testing and risk analysis.
- Verifying the security of third-party vendors and collaborating with them to meet security requirements.
- Reviewing proposed system and firewall changes for appropriateness and security risk.
- Leading investigations of security events, providing analysis results and developing and implementing remediation plans.
- **To qualify, you must have:**

- Bachelor's degree in Computer Science or a closely related field and four or more years' experience. Directly related experience may substitute for education.
- Analytical skills to resolve complex problems requiring the use of programming skills, mathematical, or technical principles and indepth, experience based crossfunctional knowledge.
- Understanding of the cyber Kill Chain and MITRE ATT&CK and experience applying them to defensive operations
- Experience analyzing packet captures to identify malicious activity
- Experience analyzing telemetry from Linux and Windows systems to identify malicious activity
- Experience aggregating & analyzing log data from endpoints, servers, IAM, and SaaS services to identify malicious activity
- Fluency in common network protocols including TCP/IP, DNS, TLS, HTTP
- Hands-on systems administration experience on Linux or Windows
- Hands-on experience deploying, operating, and managing common security tools including network-based IDS, endpoint detection & response
- (EDR), SIEM (Splunk preferred)
- Competency in at least one programming language, Python preferred

EXERCISE 1. Scan the text and find definitions to these terms:

- cyber security team
- vulnerability testing
- verifying the security
- security requirements
- remediation plans
- malicious activity

EXERCISE 2. Read the text (a vacancy) and answer the questions.

- 1) What position is demanded?
- 2) What company looks for an employee?
- 3) What type of employment is offered?
- 4) Give examples of Cyber Security Engineer's responsibilities.
- 5) What requirements to education does the company have?
- 6) What requirements to knowledge does the company have?
- 7) What requirements to skills does the company have?
- 8) What requirements to work experience does the company have?

EXERCISE 3. Read the statements and say whether they are true (T) or false (F). Correct the false ones.

- 1) An Information Security team of Boston Children's Hospital is looking for a Cyber security Specialist.
- 2) A Cyber security engineer must have Master 's degree in Computer Science.
- 3) A Cyber security engineer should specialize in developing and deploying efficient protection of software, system and networks against any potential attacks.
- 4) A Cyber security engineer usually has only one duty: to develop some software, which is to protect company's data.
- 5) A Cyber security engineer should have analytical and programming skills to perform his or her duties efficiently.
- 6) Boston Children's Hospital needs a specialist without any work experience.

- 7) Competency in at least one programming language is not necessary for a A Cyber security engineer.

EXERCISE 4. Read the text carefully and complete the sentences given below.

- 1) A Cyber security engineer should be responsible for working as a member of a cyber security team, _____ and _____ efficient protection of system, networks, software and _____ against any potential attacks.
- 2) Verifying the security of third-party _____ and collaborating with them to meet security _____ is necessary in everyday work.
- 3) Reviewing proposed system and firewall changes for _____ and security _____ is one of the responsibilities of a Cyber security engineer.
- 4) A Cyber security engineer must lead _____ of security events, providing analysis results and developing and _____ remediation plans.
- 5) Directly related _____ may substitute for education.
- 6) Professionals need analytical skills to _____ complex problems requiring the use of programming skills, mathematical, or technical principles and _____, experience based crossfunctional knowledge.
- 7) Professionals must have experience analyzing packet captures to identify _____ activity.
- 8) _____ in at least one programming language is preferred.

EXERCISE 5. Find words in the text which have a similar meaning to:

- to create
- to implement
- possible attacks
- security needs
- to monitor
- solution to a security problem
- to solve problems
- profound knowledge

EXERCISE 6. Find in the text the English equivalents for these Russian terms and expressions.

- 1) эффективная защита
- 2) уязвимости в системе
- 3) сторонний заказчик(поставщик)
- 4) обзор(оценка)
- 5) проводить исследования
- 6) планы по восстановлению системы
- 7) всесторонние (глубокие) знания
- 8) знания, основанные на опыте
- 9) вредоносные действия
- 10) практический опыт

Speaking

EXERCISE 7. Answer the following questions.

- 1) What requirements do employers have to Information security specialists?
- 2) What typical responsibilities does an Information security specialist have?(at least 7-8 duties)

- 3) What knowledge must an Information security specialist get?
- 4) What skills must an Information security specialist get?

EXERCISE 8. You are going to read a vacancy, found on www.rabota.ru. Look through requirements to the position. Make a list of skills and knowledge necessary in a Russian company. Share it with your group mates.

Специалист по информационной безопасности

Виза менеджмент сервис, ООО

Полный рабочий день

Опыт работы - От 2 лет

Образование -Высшее

Обязанности:

- Обеспечение контроля за исполнением территориальных подразделений нормативных документов, касающихся вопросов защиты информации;
- Проведение работ по выявлению и устранению инцидентов ИБ;
- Актуализация внутренних нормативных документов в области ИБ;
- Участие в проектах по обеспечению информационной безопасности в соответствии с требованиями законодательства РФ (ФЗ-152, ФЗ-98, и международных стандартов (ISO 2700x);
- Техническое проектирование систем и средств защиты;
- Проведение аудитов ИБ на соответствие требованиям законодательства РФ, отраслевых и международных стандартов в области ИБ;
- Разработка предложений по совершенствованию системы защиты информационных ресурсов Компании в соответствии с изменениями в действующем законодательстве и внутренних нормативных актах.
- Проверка выполнения регламентов информационной безопасности сотрудниками Компании.
- Накопление, структуризация и анализ информации о защищенности корпоративной сети, необходимой для выработки мер по ее совершенствованию.
- Мониторинг профильных источников информации, подготовка данных для анализа и предложений.
- Участие в проведении мероприятий по предотвращению утечки информации, составляющей коммерческую тайну, в процессе ее накопления, хранения, обработки, передачи в автоматизированных системах.
- Участие в проведении служебных расследований и разбирательств в установленном порядке по фактам нарушений регламентов информационной безопасности.
- Оказание методической и практической помощи в обеспечении информационной безопасности сотрудникам иных подразделений

Требования:

- Высшее образование
- Английский язык – свободное владение
- Опыт работы в подразделениях ИБ не менее 2 лет
- опыт внедрения/поддержания/развития СУИБ в соответствии с ISO 27001;
- Знание принципов работы и построения локальной сети;
- Знание и понимание работы Active Directory, DNS, DHCP, WSUS.
- Знание требований законодательства РФ (149-ФЗ, 152-ФЗ, 98-ФЗ и т.д.), нормативно-методических документов ФСТЭК и ФСБ России Знание и опыт работы с технологиями обеспечения информационной безопасности.
- Знание основных рисков и угроз информационной безопасности.

EXERCISE 9. Prove the following statements.

1. An Information security specialist deal with some additional responsibilities except protecting confidential data.
2. The most important requirement to an Information security specialist is appropriate work experience.
3. Information Security refers to practice rather than theory.

EXERCISE 10. Browse the Internet resources and find a vacancy you are interested in. Work in pairs and prepare a dialogue. Here is the topic of your conversation.

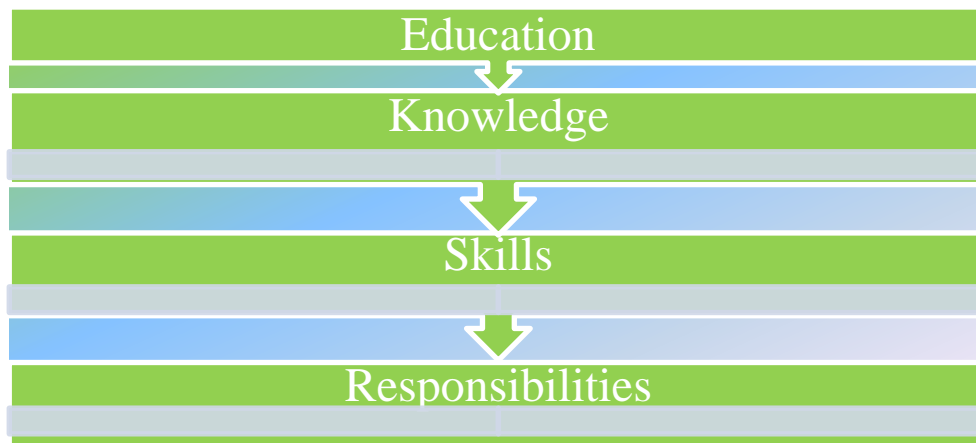
You are discussing a position of an InfoSec specialist presented in a vacancy.

- 1) Student A is very interested in the position benefits and has a lot of questions to a sales assistant about it.
- 2) Student B explains the advantages and disadvantages of the position.

Writing

EXERCISE 11. Fill in the chart and describe it using all the necessary expressions.

Job requirements to a Cyber Security Engineer



Revision

EXERCISE 1. Choose the correct word or word combination to complete the sentence.

- 1) Computer security specialists help businesses and government organizations to _____ their computer networks and protect important data stored there.
A. control access to B. help to use C. specialize
- 2) A bachelor's _____ in computer science is highly recommended.
A. education B. degree C. experience
- 3) Trained computer security specialists are _____ by corporations and institutions needing their services.
A. hired B. assisting C. working

- 4) Computer security specialists are _____keeping accurate and up-to-date backup files of all important data shared on a computer network.
A. responsible in B. interested in C. responsible for
- 5) Computer security specialists, who are also known as information security specialists, design and _____network control mechanisms.
A. delete B. implement C. sell
- 6) Computer security specialists must know a variety of networking technologies and must have a thorough understanding of _____.
A. psychology of people B. computer programming C. teaching methods
- 7) Computer security specialists should use analytical skills to _____ complex problems.
A. solve B. accept C. analyze.
- 8) The company looks for a candidate with _____experience deploying, operating, and managing common security tools.
A. no. B. hands-on. C. good.
- 9) _____with third-party vendors is necessary to understand security requirements.
A. Asking B. Collaborating. C. Talking.
- 10) Bachelor's degree in _____or a closely related field and four or more years' experience are required for the position of InfoSec specialist.
A. Social Science B. Physics C. Computer Science

EXERCISE 2. Translate the words in the right column into English and the words in the left column into Russian.

1. to control access		1. Опыт работы
2. to design network control mechanisms		2. Заказчики
3. to implement network control mechanisms		3. Законодательство
4. to deploy		4. риски и угрозы информационной безопасности
5. to assess security risks		5. Требование работодателя
6. to control access		6. выявление и устранение инцидентов ИБ
7. to design network control mechanisms		7. проведение служебных расследований
8. to verify		8. Оказание методической и практической помощи в обеспечении информационной безопасности

EXERCISE 3. Match the words to find synonyms.

1) To perform duties	a) To deploy
2) To implement	b) To take responsibilities
3) To design security tools	c) To coordinate
4) To control the work	d) To develop
5) To check	e) To collaborate with
6) To work with	f) To assess

EXERCISE 4. Put the words in the correct word order.

- 1) security / other employees / work / with / specialists/ computer.
- 2) security specialists/ design / network control mechanisms / implement / that / to control / to a computer network/ and /computer / serve / users' access.
- 3) specialists / may be / controlling /access to computers / computer security / also / responsible for / physical.
- 4) a computer network/ security/ using/ computer/ specialists/ who/ is/ monitor.
- 5) is/ for /security specialists/ training / computer / necessary /beyond /some/ high school / future.

EXERCISE 5. Translate the following sentences from Russian into English.

- 1) Обязанности специалиста по информационной безопасности включают мониторинг и администрирование средств защиты информации; участие в разработке нормативной документации и согласовании договоров.
- 2) Участие в проектах по обеспечению информационной безопасности в соответствии с требованиями законодательства входит в обязанности специалиста по информационной безопасности.
- 3) Наличие сертификатов обучения по профилю информационной безопасности является преимуществом для потенциальных кандидатов на данную должность.
- 4) На собеседовании обычно проверяют умение ориентироваться в современных средствах защиты информации (антивирусы, фаерволлы, средства криптографической защиты, и прочие).
- 5) Знание общих принципов построения информационной безопасности в организации будет полезным в будущей работе.
- 6) Знание требований законодательства к обработке персональных данных в информационных системах является обязательным для все сотрудников отдела Информационной безопасности.
- 7) Любой профессионал в современном мире должен иметь опыт работы с электронными документами в MS Office.
- 8) Знание международных стандартов в области защиты информации (ISO 2700x, Cobit и т.д.) позволяет успешно разрабатывать стратегии защиты информации в компании.
- 9) Обучение и повышение осведомленности сотрудников Компании по вопросам ИБ входит в обязанности сотрудников отдела информационной безопасности.
- 10) Высшее образование и опыт работы в сфере информационной безопасности является преимуществом при выборе новых сотрудников.

APPENDIX I

Additional reading

Text I

Digital habits across generations

Today's grandparents are joining their grandchildren on social media, but the different generations' online habits couldn't be more different. In the UK the over-55s are joining Facebook in increasing numbers, meaning that they will soon be the site's second biggest user group, with 3.5 million users aged 55–64 and 2.9 million over-65s.

Sheila, aged 59, says, 'I joined to see what my grandchildren are doing, as my daughter posts videos and photos of them. It's a much better way to see what they're doing than waiting for letters and photos in the post. That's how we did it when I was a child, but I think I'm lucky I get to see so much more of their lives than my grandparents did.'

Ironically, Sheila's grandchildren are less likely to use Facebook themselves. Children under 17 in the UK are leaving the site – only 2.2 million users are under 17 – but they're not going far from their smartphones. Chloe, aged 15, even sleeps with her phone. 'It's my alarm clock so I have to,' she says. 'I look at it before I go to sleep and as soon as I wake up.'

Unlike her grandmother's generation, Chloe's age group is spending so much time on their phones at home that they are missing out on spending time with their friends in real life. Sheila, on the other hand, has made contact with old friends from school she hasn't heard from in forty years. 'We use Facebook to arrange to meet all over the country,' she says. 'It's changed my social life completely.'

Teenagers might have their parents to thank for their smartphone and social media addiction as their parents were the early adopters of the smartphone. Peter, 38 and father of two teenagers, reports that he used to be on his phone or laptop constantly. 'I was always connected and I felt like I was always working,' he says. 'How could I tell my kids to get off their phones if I was always in front of a screen myself?' So, in the evenings and at weekends, he takes his SIM card out of his smartphone and puts it into an old-style mobile phone that can only make calls and send text messages. 'I'm not completely cut off from the world in case of emergencies, but the important thing is I'm setting a better example to my kids and spending more quality time with them.'

Is it only a matter of time until the generation above and below Peter catches up with the new trend for a less digital life?

<https://learnenglish.britishcouncil.org/skills/reading/b1-reading/digital-habits-across-generations>

Text II

You and your data

As the Internet and digital technology become a bigger part of our lives, more of our data becomes publicly accessible, leading to questions about privacy. So, how do we interact with the growing digital world without compromising the security of our information and our right to privacy?

Imagine that you want to learn a new language. You search 'Is German a difficult language?' on your phone. You click on a link and read an article with advice for learning German. There's a search function to find German courses, so you enter your city name. It asks you to activate location services to find courses near you. You click 'accept'. You then message a German friend to ask for her advice. When you look her up on social media, an advertisement for a book and an app called German for Beginners instantly pops up. Later the same day, while you're sending an email, you see an advert offering you a discount at a local language school. How did they know? The simple answer is online data. At all stages of your search, your devices, websites and applications were collecting data on your preferences and tracking your behaviour online. 'They' have been following you.

Who uses our data and why?

In the past, it was easy for people to keep track of their personal information. Like their possessions, people's information existed mostly in physical form: on paper, kept in a folder, locked in a cupboard or an office. Today, our personal information can be collected and stored online, and it's accessible to more people than ever before. Many of us share our physical location, our travel plans, our political opinions, our shopping interests and our family photos online – as key services like ordering a takeaway meal, booking a plane, taking part in a poll or buying new clothes now take place online and require us to give out our data.

Every search you make, service you use, message you send and item you buy is part of your 'digital footprint'. Companies and online platforms use this 'footprint' to track exactly what we are doing, from what links we click on to how much time we spend on a website. Based on your online activity, they can guess what you are interested in and what things you might want to buy. Knowing so much about you gives online platforms and companies a lot of power and a lot of money. By selling your data or providing targeted content, companies can turn your online activity into profit. This is the foundation of the growing industry of digital marketing.

Can you protect your data?

Yes ... and no!

Some of the time our personal data is shared online with our consent. We post our birthday, our photographs and even our opinions online on social media. We know that this information is publicly accessible. However, our data often travels further than we realize, and can be used in ways that we did not intend. Certain news scandals about data breaches, where personal data has been lost, leaked or shared without consent, have recently made people much more aware of the potential dangers of sharing information online.

So, can we do anything to protect our data? Or should we just accept that in fact nothing is 'free' and sharing our data is the price we have to pay for using many online services? As people are increasingly aware of and worried about data protection, governments and organisations are taking a more active role in protecting privacy. For example, the European Union passed the General Data Protection Law, which regulates how personal information is collected online. However, there is still much work to be done.

As Internet users, we should all have a say in how our data is used. It is important that we pay more attention to how data is acquired, where it is stored and how it is used. As the ways in which we use the internet continue to grow and change, we will need to stay informed and keep demanding new laws and regulations, and better information about how to protect ourselves. Safer Internet Day is an ideal time to find out more about this topic.

<https://learnenglish.britishcouncil.org/general-english/magazine-zone/you-and-your-data>

Text III

The Application of Computer in Various Fields

The Invention of computers has led to advancements in science and technology. Life has become more potential with the use of computers in our daily life. Earlier, it was mainly used by large organizations for research and engineering applications. But today, the computer is being used in almost every field of our life. The application of computer major area is as follows.

1. Military:

The Application of computer plays a vital role in the design and development of high tech weapons for defense where absolute accuracy is essential. The whole world saw the vast use of computers in defense during the Gulf and Afghanistan wars and also in the Iraq war.

Computerized simulation exercises are very helpful in training pilots. Computers are used to help in fighting terror by locating unlawful elements in the world with high accuracy. With the use of computer technology, government around the world can successfully execute their plans through effective planning. The world saw how America was able to plan the downfall of Osama and located him accurately.

2. Banks:

As a result of the computerization and networking of a large number of banks, several facilities are being offered to the customers. Using online banking, you can check your past transactions from the date of the account opening with real-time balance.

Money can be easily be transferred to any account across the globe. Internet banking also allows to use ATM or Debit Card, Credit Card to shop, buy tickets, pay bills for utility services like electricity, telephone, and mobiles recharge.

You can even subscribe to a free monthly bank account statements and apply online to open fixed deposits. The facility of subscribing to mobile banking enables you to virtually carry along the bank with you.

3. Research:

The computer is facilitating the research work in a tremendous way by performing complex computations, which sometimes seem impossible for humans. Some of them are listed below:-

- The computations required for launching a new satellite into space in one such example.
- Earthquakes and Tsunami warnings are possible with the aid of computers.
- Weather forecasting is done with help of computers.
- Impact of nuclear tests can be studied using computers.

4. Education:

The application of computer play vital role in Computer-aided learning and teaching is changing the entire spectrum of our education system. The multimedia-rich computerized animation and video help students to understand the concepts in a very simple and effective manner.

Virtual Classroom s is a reality nowadays. The technology uses video conferencing and online modules of study material for learning. With the advent of e-learning, students can study as per schedule. Now, it has become possible to conduct online entrance exams at the national and international levels with the help of computers.

The results of various education boards, as well as entrance exams, are available online. Students can find information about various colleges through the Internet and can apply online for desired courses.

5. Media and Communication:

The application of computers has played a major role in revolutionizing the communication system. From the Advent of Telephones and Television which were perceived as incredible things, we have come a long way to enjoy the facilities like mobile phones, the Internet, E-mail, SMS, Chating, Cable TV Video Conferencing, etc.

Music can be composed by using MIDI (Musical Instrument Digital Interface), which allows editing and controlling of sound. A variety of musical formats can be played as well as recorded by using computers.

6. Criminal Identification and LAW Enforcement:

The application of computers can create close resembling photographs of criminals. This help CBI(Central Bureau of Investigation) staff to identify the criminals. The police use the DNA fingerprinting technique to identify accused with the help of skin, hair, or blood samples collected from the site of crime.

The traffic police use speed cameras on traffic lights to monitor people for law violations. The police also use computers to track the information of stolen automobiles and mobile phones in order to catch the criminals in no time.

6. Entertainment:

At home, the applications of computers are being used for as well as entertainment. With the advent of a computer, the member of the family can have easy access to games music, movie e-mail, chatting, and research for their projects and assignments. People can even enjoy the facility of watching television on their computers.

7. Business:

Computer has helped in improving business activities throughout the world. The organization can have access to the latest technology and manpower across the world. E-commerce has completely changed the scenario of online shopping.

Much more online business growth from the application of computer such as Amazon, Flipkart, etc. Global business relations can be now maintained through the Internet. Computers are used in offices for maintaining sales and marketing records, stock control, Planning, Productions, Tax Records and preparing salary sheet etc.

8. Animation and Films:

In the field of entertainment, **the** computer is used for making cartoon films, producing special musical effects, and bringing fantasy to life in movies. Cartoon characters like Walt Disney's Mickey and Donald, Tom, and Jerry, etc are given animation effects through computers.

Movie-like Jurassic Park, Godzilla, Happy Feet Robot, and Kung Fu Panda have used the latest computer animation techniques for giving special effects.

9. Book Publishing:

With the help of the computer, designing, typing, and editing work can be done with great ease and efficiency. We can insert pictures, and apply various formatting features and styles to a book in no time using a computer.

10. Commercial Purpose:

Advanced reservation of rooms in hotels and booking of cinema tickets is now possible from anywhere with the advent of the Internet. The billing system in theaters, shopping malls are hotels that have become possible through computers.

11. Engineering and Manufacturing:

The Application of computers has played a major role in Computed Aided Design (CAD) and Computer-Aided Engineering (CAE) for designing and manufacturing high-quality products like cars and planes.

Architects use a computer for designing the layout of building and viewing the objects in details. A robot is big advancement in technology which is used to skillful and repetitive work. Manufacturing with support of robots and computers is called Computer Aided Manufacturing (CAM).

12. Sports:

Computers are also used in the field of sports. The sports equipment used by athletes is first tested on computers. There are several sports exercising equipment, which have inbuilt programs to train to sportspeople.

The training of athletes is done with aid of computers, Scoreboards, recording speed of players, Action replay, printing and selling of tickets are also done with help of computers.

13. Medical Science:

The Application of Computer help in diagnosing diseases and controlling important medical processes like CITI scan, X-ray, ECG, and Ultrasounds.

Computerized equipment is helpful in maintaining patients' medical records and performing surgeries. Computers can be used for research and to help doctors in the treatment of diseases.

14. Government Sector:

Computers are used for official correspondence, budgeting, accounts, reporting, payroll, attendance, uploading of various schemes, forms, etc. Sectors like census bureau, Income TAX, airline and railway, electricity board of telephone exchanges are benefiting from computer technology.

15. Library and Museum:

The Application of the Computer of the library help to maintain records of the issue and deposit dates of books, encyclopedias, CDs, etc. A computer can maintain a subject-wise listing of books and helps in indexing and searching a particular book quickly.

People can read newspapers, magazines, and journals online. In museums, computers are used to give information and play recorded commentary on relevant topics.

The advantage and applications of computers in various fields are unlimited. Now it must be evident to you how computers become an essential part of our life. It has influenced our lives to such an extent that we cannot even imagine working without this electronic device.

https://conceptsall.com/the-application-of-computer-in-various-fields/#Application_of_computers_in_various_fields_PDF

Text IV

10 Entry-Level IT Jobs and What You Can Do to Get Hired

IT is a wide and growing field. Jobs in the IT sector in the US are projected to grow at a much faster rate than other occupations in the next decade.

And it's versatile too. You can start at the help desk and work your way up to any number of specialized jobs as you grow. Or you can jump straight into a field you're interested in if you have some background knowledge. Here are ten entry-level IT positions to consider as you begin your job search.

1. Help desk technician

Average annual salary: \$42,508

Job outlook: 9% annual growth

Requirements: Knowledge of computer systems and troubleshooting. Certifications, associate degrees, or bachelor's degrees may be requested.

When a computer user or employee is having problems with hardware, software, or a network, they call on a help desk specialist to assist. A help desk technician might maintain, install, or troubleshoot hardware and software, resolve networking issues, or help resolve other problems for other company employees.

The title for this role might vary. Help desk technicians can also be called help desk analysts, desktop support technicians, service desk technicians, and computer support specialists, among several other titles. These positions collectively are sometimes referred to as help desk positions.

Many IT professionals start their careers in help desk roles. If you don't know where to start in IT, this is a good role to consider; it'll expose you to other areas of IT you might be interested in. As you gain experience, it's possible to move into other jobs, like system or network administrator, cloud engineer, or information security analyst.

2. IT technician

Average annual salary: \$42,769

Job outlook: 8% annual growth

Requirements: Knowledge of computer systems and troubleshooting. Certifications, associate degrees, or bachelor's degrees may be requested.

Like help desk technicians, IT technicians work to support the technical issues within an organization's computer system. But while help desk technicians might spend more time resolving user issues, IT technicians are more likely to spend time doing the actual technical work to resolve the issue. An IT technician should be able to troubleshoot, know how to use several operating systems, and understand the basics of IT networks.

IT technicians can also be called IT associates, IT analysts, or IT specialists. Some companies may have IT technicians do help desk work as well.

3. Web developer

Average annual salary: \$77,200

Job outlook: 13% annual growth

Requirements: Ability to program. Associate, bachelor's, or master's degrees may be requested.

Web developers create websites that businesses use to operate and interact with their customers. This field breaks down into three main areas: front-end, back-end, and full-stack developers. Front-end developers design the parts of a website that users interact with. Back-end developers build and maintain the server, application, and database that power a website. Full-stack developers do both.

Requirements for entry-level candidates will vary by company and industry. It's possible to get a job with a high school diploma or an associate's degree, especially if you've done some web development on your own. Front-end programming languages you'll want to learn include HTML, CSS, and Javascript. Back-end programming languages might include Python, Ruby, or PHP.

4. Systems administrator

Average annual salary: \$80,600

Job outlook: 5% annual growth (as fast as average)

Requirements: Experience with computer systems. Certifications, associate degree, bachelor's degree, or equivalent experience may be requested.

System administrators, also called computer administrators, install, configure, and maintain operation of multi-user computer systems and servers. A successful sysadmin uses their knowledge of software, hardware, and networks to keep businesses running smoothly. Their roles can overlap heavily with network administrators.

Keeping up with the latest network technology is a lifelong learning process. As you expand your skill set and learn to use the latest products, you can advance to roles like systems engineer or systems architect.

5. Systems analyst

Average annual salary: \$99,270

Job outlook: 7% annual growth (faster than average)

Requirements: Certifications, associate degree, bachelor's degree, or equivalent experience may be preferred.

Systems analysts might sound similar to systems administrators, but they're quite different. The goal of a systems analyst is to make a company's computing systems more efficient and effective. They identify opportunities for improvement and design, test, and deploy systems to execute those improvements.

While not always a requirement, a bachelor's degree in computer or information science can make you competitive for this job.

6. Database administrator

Average annual salary: \$98,860

Job outlook: 8% annual growth (much faster than average)

Requirements: Certifications, associate degrees, or bachelor's degrees may be requested.

Database administrators (DBAs) store, organize, and secure data. This is an especially critical task for companies with large information systems (like banks and hospitals). Ensuring that databases operate efficiently helps companies analyze and leverage this data for growth.

Build a foundation for a job in database administration with a bachelor's degree in a computer or information-related field. You can also set yourself up for success by learning database languages, most commonly Structured Query Language (SQL).

7. Site reliability engineer

Average annual salary: \$101,923

Job outlook: 34% annual growth (much faster than average)

Requirements: Site reliability or DevOps experience and related skills. Bachelor's degree, or equivalent experience may be requested.

Site reliability engineers (SREs) keep the websites and apps we use up and running smoothly. SREs develop automated solutions for common development and operational tasks, like latency monitoring, capacity planning, and emergency responding. As long as technology continues to play a role in our day-to-day lives, there will be a growing demand for SREs.

Besides a computer science degree, you can elevate your resume with a certification in DevOps or SRE. You may also expand your job opportunities by learning a scripting programming language, like Python. As you start out as an SRE, you'll develop skills that transfer to other roles in IT, including cloud or full-stack engineering.

8. Software developer

Average annual salary: \$110,140

Job outlook: 22% annual growth (much faster than average)

Requirements: Experience with programming languages. Bachelor's degrees or master's degrees may be requested.

Software developers (sometimes called software engineers) build the systems and applications that run on computers, phones, and other devices. These programs are typically designed to allow companies or employees to perform specific tasks, like managing data or collaborating across teams.

Many software developers have a bachelor's degree in computer science or software engineering. You can also gain relevant experience through coursework or a boot camp, or through an internship.

9. Information security analyst

Average annual salary: \$102,600

Job outlook: 33% annual growth (much faster than average)

Requirements: Certifications, associate degrees, or bachelor's degrees may be requested.

Information security analysts (also called cyber security analysts) are tasked with protecting a company's computer networks and systems. This involves planning and implementing security measures and quickly addressing security breaches should they occur. As technology continues to advance, so does the need for robust security.

Develop your skill set through an entry-level information security certification like the CompTIA Security+. Many information security analysts have a bachelor's degree in information assurance or computer science. If you can't land an information security analyst position immediately, try getting your foot in the door with a help desk or IT technician position, and build experience from there.

10. Cloud engineer

Average annual salary: \$103,903

Job outlook: 27% annual growth (much faster than average)

Requirements: Knowledge of cloud platforms. Bachelor's degree, master's degree, or equivalent experience are typically preferred.

Cloud engineers help businesses migrate applications, functions, and processes to the cloud. They typically oversee the design, configuration, and monitoring of cloud-based services like Amazon Web Services (AWS), Microsoft Azure, and the Google Cloud Platform. As more companies move their IT infrastructure to the cloud, the demand for cloud engineers continues to rise.

Many companies look for entry-level candidates with at least a bachelor's degree in computer science or a related field. That said, having relevant experience can set you up to be competitive for the job as well. If you're working your way up to become a cloud engineer, try starting in positions like system or network administration that'll expose you to some work with the cloud. As you gain experience, you can advance to become a cloud developer, cloud administrator, or cloud architect.

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<https://www.coursera.org/articles/entry-level-it-jobs>

Text V

How to become a penetration tester: A complete career guide

Last updated: April 21, 2022

Penetration testers are the so-called "ethical hackers," or the good guys. Also known as assurance validators, penetration testers are hired by network system owners and web-based application providers to probe for vulnerabilities that hackers with nefarious intent might be able to exploit to gather secure data and intelligence.

Ethical hackers perform vulnerability assessments (along with other tasks) by exercising their skills and knowledge — and actually get paid to perform the equivalent of digital break-ins.

They simulate actual cyber attacks using a broad range of tools and methods, some of their own creation, leaving no stone unturned to unearth cracks in security protocols for networks, systems, and web-based applications.

The idea of a penetration test, or pen test for short, is to probe all possible ways to penetrate any given computer system, to find gaps in security systems BEFORE the real hackers can get in. As a result, pen testers often work on highly confidential and time-sensitive projects, so being trustworthy and cool under pressure are important skills.

Having the creativity to think on the fly, and being organized enough to track, record, and report on projects are also good qualities in penetration testing.

Six steps to becoming a penetration tester

Self-analysis: Penetration testing is not for everyone. It requires exceptional problem-solving skills, a dogged determination, dedication to detail, and a desire to remain continually educated on the latest trends in the field. Successful ethical hackers must possess a high level of each of these qualities in order to excel. So be honest in the self-assessment before deciding whether pen testing is an appropriate career.

Education: At one time, many employers were known to hire real-world hackers, and convert them from the “dark side” to work for the good guys. In recent years, however, college degrees have become near mandatory for penetration testers. Undergraduate degrees in the various disciplines of cyber security all provide viable entryways into the field.

Career path: There are several ways a would-be pen tester can break into the cyber security industry. Starting out in security administration, network administration, network engineer, system administrator, or web-based application programming, always focusing on the security side of each discipline, will provide a good foundation for pen testing.

Professional certifications: Employers predominantly want to see a number of professional certifications on the resumes of assurance validators, and this is particularly true with more senior positions. Several organizations now offer widely-recognized certifications for penetration testing occupations.

Honing the craft: Becoming an expert in a chosen field is a good idea in any career, but for penetration testers, there are varied ways of standing out from the crowd. Being active and recognized in cyber security disciplines, such as bug bounty programs, collecting open-source intelligence (OSINT), and developing proprietary attack programs, will all get pen testers recognized among peer groups.

Keep current: As with most cyber security career paths, it is vital to remain current with what is happening in the industry. Keeping skills and knowledge up-to-date with all of the latest trends in programming and network security, ever-changing hacking techniques and security protocols, popularly exploited vulnerabilities, and anything else happening in the cyber security industry.

Penetration tester skills and experience

Employer requirements of new hires in the penetration testing field, as in all cyber security disciplines, will vary dramatically depending upon the detailed functions of each position and the level of the position. Associate or junior pen testers, mid-level pen testers, and senior or lead pen testers obviously represent sequentially advancing experience levels and responsibilities within the penetration testing umbrella.

Some positions still require only a demonstration of relevant skills and an appropriate level of cyber security experience and knowledge. Increasingly, though, employers are seeking candidates with a bachelor’s degree in information security or related computer science degrees. Some more advanced positions require a master’s degree.

Work experience that often leads to careers in penetration testing includes software development and coding, security testing, vulnerability assessment, network engineer or administrator, security administrator.

Skill requirements likely to be encountered with employers include:

- ✓ Knowledge of specific computer languages, such as: Python, Powershell, Golang, Bash.

- ✓ Experience with network OS, Windows/ Linux/ MacOS, communications protocols, firewalls, IPS/IDS systems, virtual environments, data encryption, and mobile penetration testing of IOS/Android systems.
- ✓ Knowledge of common pen test and application security tools, such as: Kali, Metasploit, Burpsuite, Wireshark, Web Inspect, Network Mapper (NMAP), Nessus, and others.
- ✓ Common professional certifications often sought by employers include those available from: IEEE (Institute for Electrical and Electronic Engineers) OSCP (Offensive Security Certified Professional), SANS Technology Institute, GIAC (Global Information Assurance Certification), and EC-Council.
- ✓ Soft skills and experience sought by employers include: excellent communication skills; self-driven, creative, and resourceful; contributions to open source projects and bug bounty programs; and familiarity with OWASP Top 10 vulnerabilities.

What do penetration testers do?

Generally speaking, pen testers typically perform threat modeling, security assessments, and ethical hacking of networks, systems, and web-based applications. More specifically, assurance validation involves some or all of the following tasks:

- ✓ Gather and analyze Open Source Intelligence (OSINT) to find information disclosures.
- ✓ Provide subject matter expertise focusing on offensive security testing operations, working to test defensive mechanisms in an organization.
- ✓ Conduct assessments on a wide variety of technologies and implementations utilizing both automated tools and manual techniques.
- ✓ Develop scripts, tools, and methodologies to enhance testing processes.
- ✓ Assist in the scoping of prospective engagements, leading engagements from initial stages through implementation and remediation.
- ✓ Conduct social engineering exercises and physical penetration tests.
- ✓ Test wired and wireless networks for security vulnerabilities.
- ✓ Examine assessment results to identify findings and develop a holistic analytic view of the system within the environment in which it operates.
- ✓ Identify the root cause of technical and non-technical findings.
- ✓ Publish an Assessment Report that documents findings and identifies potential countermeasures.
- ✓ Track findings that are repeated across multiple assessments and communicate these findings.
- ✓ Upon completion of assessments, communicate methods employed, findings, and analytic.
- ✓ Provide technical support to ISOs in remediating assessment findings.
- ✓ Provide technical support in network exploitation and evasion techniques to assist in comprehensive incident handling and forensic analysis of compromised systems.

<https://cybersecurityguide.org/careers/penetration-tester/>

APPENDIX II

PHRASAL VERBS in Computer science	Common PHRASAL VERBS
<ul style="list-style-type: none"> ✓ To boot up ✓ To click on ✓ To filter out ✓ To go down ✓ To go online/offline ✓ To hack into ✓ To hook up ✓ To key in ✓ To log in/on ✓ To log off/out ✓ To opt in/out ✓ To plug in ✓ To pop up ✓ To power up/down ✓ To print out ✓ To pull down ✓ To run out of ✓ To scroll up/down ✓ To set up ✓ To shut down ✓ To sign in ✓ To start up ✓ To turn on/off ✓ To turn up/down ✓ To wipe out ✓ To zoom in/out 	<ul style="list-style-type: none"> ✓ To agree to/with ✓ To answer back ✓ To answer for ✓ To ask for ✓ To ask about ✓ To call off ✓ To carry on ✓ To do over ✓ To figure out ✓ To give up ✓ To go over ✓ To hold on ✓ To keep on ✓ To look for ✓ To put off ✓ To work out

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