MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Budgetary Educational Institution of Higher Education
"Ural State University of Economics"

**Approved**
at the Department meeting

November 27, 2025

Protocol # 10

Head of the Department Radygina E.G.

**Approved**
by the Council for Educational and Methodological Issues and Quality of Education

December 16, 2025

Protocol # 4

Chairman _____ Karkh D.A.
*(signature)*

# COURSE PROGRAMME

| | |
|---|---|
| Title | Modern information technologies in tourism and hospitality |
| Field of study | 38.04.02 Management |
| Profile | Management of International Tourism (in English) |
| Form of study | Full-time |
| Year of enrollment | 2026 |

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Ekaterinburg
2025

**CONTENTS**

## INTRODUCTION

The work program of the discipline is part of the main professional educational program of higher education-the master's program developed in accordance with the Federal State Educational Standard of Higher Education

| | |
|---|---|
| State Educational Standard of | Federal State Educational Standard of Higher Education<br>-Master's degree in the field of training 38.04.02 Management (Order of the Ministry of Education and Science of the Russian Federation No. 952 of |

## 1. THE PURPOSE OF MASTERING THE DISCIPLINE

is to develop professional competencies in the field of computer and information sciences, information systems and technologies, the features of working in the Astra Linux operating system, the basics of working in the LibreOffice office suite and web technologies.

## 2. PLACE OF THE DISCIPLINE IN THE STRUCTURE OF THE MAIN PROFESSIONAL EDUCATIONAL PROGRAM

Discipline refers to the part formed by the participants of educational relations.

## 3. SCOPE OF THE DISCIPLINE

| Intermediate certification | Hours | | | | credit units |
|---|---|---|---|---|---|
| | Just a semester | Contact work (according to study assignments) | | Independent work Independent work including preparation of tests and term | |
| | | papers Total | Practical exercises, including course design e | | |
| Semester 3 | | | | | |
| Credit | 72 | 8 | 8 | 64 | 2 |

## 4. PLANNED RESULTS OF MASTERING THE MAIN PROFESSIONAL EDUCATIONAL PROGRAM

As a result of mastering the main professional educational program, the graduate should have formed the competencies established in accordance with the Federal State Educational Standard for Higher Education.

| Code and name of the competence | Indicators of achievement of competencies |
|---|---|
| organizational and managerial | |
| PC-3 Definition of the concept and strategy of development of a tourist organization | AI-1.PC-3 Know:<br>Laws and other regulatory legal acts in the field of tourism and consumer protection; industry rules and standards; labor and civil legislation; Local regulatory acts of the organization, including internal labor regulations and instructions on labor protection and fire safety; Priority areas for tourism development in Russia and in the world; Organization of financial and economic activities<br>organization of marketing and advertising activities of a tourist organization; организации; |

| | |
|---|---|
| PC-3 Definition of the concept and development strategy of the tourist organization | AI-2.PC-3 Should Be Able To: To plan the activities of a tourist organization; To determine promising areas of activity of a tourist organization; To use specialized software; |
| | AI-3.PC-3 Have practical experience: Defining the concept of development of a tourist organization; Developing a strategy and development plan for a tourist organization; Ensuring the implementation of projects in accordance with the approved development strategy of a tourist organization. |
| PC-4 Organization of activities for the implementation of tourist services | AI-1.PC-4 Know: Fundamentals of economics, labor organization and management; Specialization and features of the structure of a tourist organization; Fundamentals of office management; Economics of international tourism; Fundamentals of Psychology, Ethics, Aesthetics; |
| | AI-2.PC-4 Should Be Able To: Organize the work and interaction of departments of the tourism organization; Manage the development of the marketing plan and marketing programs of the tourism organization; Determine the marketing price strategy of the tourism organization; Develop the marketing communication strategy of the tourism organization; Develop the marketing sales strategy of the tourism organization; Monitor the marketing activities of the tourism organization; Organize and conduct business negotiations; Determine the terms and conclude contracts related to Control the quality of tourist and excursion services and the fulfillment of the terms of contracts for the provision of tourist services; |
| | AI-3.PC-4 Have practical experience: Implementation of general management of the main, administrative, economic and financial-economic activities of the tourist organization; Approval of current and future work plans of the tourist organization; Forecasting and planning the volume of sales of tourist services; Formation of the marketing strategy of the tourist organization and management of marketing and sales of tourist and excursion services; Organization of work on the development of programs and technological documents of the tourist product; Organization of work on identifying problems in the activities of the tourist organization (division), reviewing customer comments and suggestions, managing conflict situations and resolving them. |

## 5. THEMATIC PLAN

| Topic | of Hours | | | | | | |
|---|---|---|---|---|---|---|---|
| | Name of topic | Total hours | Contact work (according to study assignments) | | | independent work | Control of independent work |
| | | | Lectures | Laboratory exercises | Practical exercises classes | | |
| Semester 3 | | 72 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Topic 1. | Information technologies: basic concepts, development history and classification (PC-3) | 7 | | | 1 | 6 | |
| Topic 2. | Information technologies of data processing (PC-3) | 7 | | | 1 | 6 | |
| Topic 3. | Information technologies of office automation (PC-3) | 7 | | | 1 | 6 | |
| Topic 4. | Information systems: concept, classification and structure (PC-3) | 7 | | | 1 | 6 | |
| Topic 5. | Reference and Legal Information Systems (PC-3) | 7 | | | 1 | 6 | |
| Topic 6. | Geographic information systems (PC-4) | 8.5 | | | 0.5 | 8 | |
| Topic 7. | Multimedia technologies (PC-4) | 6.5 | | | 0.5 | 6 | |
| Topic 8. | Astra Linux operating system (GPC-5) | 6.5 | | | 0.5 | 6 | |
| Topic 9. | File System UNIX/Linux families (Astra Linux) (PC-4) | 5.5 | | | 0.5 | 5 | |
| Topic 10. | Working with text editors in the Astra Linux operating system (PC-4) | 4.5 | | | 0.5 | 4 | |
| Topic 11. | Structuring, storing and processing information in the Astra Linux operating system (PC-4) | 5.5 | | | 0.5 | 5 | |

## 6. FORMS OF ONGOING MONITORING AND INTERIM CERTIFICATION ШКАЛЫ ASSESSMENT SCALES

| Section/Subject | Type of evaluation tool | Description of the evaluation tool | Evaluation criteria |
|---|---|---|---|
| Current control (Appendix 4) | | | |
| Topic 1 | Test | Test #1 on "System and application software" contains 50 questions | 50 points |
| Topic 2 | Test | Test # 2 on "Fundamentals of algorithmization and development" contains 50 questions | 50 points |
| Topic 3 | Test | Test # 3 on "Computer Architecture" contains 50 questions | 50 points |
| Topic 4 | Test paper | Control work # 1 contains 20 variants of 6 tasks | 50 points |
| Topic 5 | Control work | Control work # 2 contains 5 variants of 12 tasks | 50 points |
| Intermediate certification (Appendix 5) | | | |
| 3 semester (For) | Test ticket (Appendix 5) | The ticket includes one theoretical question and one | credit |

## DESCRIPTION OF ASSESSMENT SCALES

The indicator for assessing the development of the main professional educational program is formed on the basis of combining the current control and intermediate certification of the student.

The rating indicator for each discipline is expressed as a percentage, which shows the level of preparation of the student.

Current control. A 100-point rating system is used. Assessment of student performance during the semester is carried out by the teacher in accordance with the developed system of assessment of academic achievements in the course of training in this discipline.

The working programs of disciplines and practices set out the types of ongoing control, planned results of control activities, and criteria for evaluating academic achievements.

During the semester, the teacher conducts at least 3 control activities to assess the student's performance. If class attendance in a discipline is included in the rating, then this indicator is no more than 20% of the maximum number of points in the discipline.

Intermediate certification. A 5-point rating system is used. Assessment of the student's work at the end of the discipline (part of the discipline) is carried out by the teacher in accordance with the system developed by him for evaluating the student's achievements in the course of training in this discipline. Intermediate certification is also carried out at the end of competence formation.

The procedure for transferring the rating provided for by the rating system for a discipline to a five-point system.

High level-100% - 70% - excellent, good.

Average level-69% - 50% - satisfactory.

| Rating indicator | 5-point rating indicator | Indicator characteristics |
|---|---|---|
| 100% - 85% | excellent | have excellent theoretical knowledge in full,<br>understand, independently know how to apply,<br>research, identify, analyze,<br>systematize, categorize,<br>calculate indicators, classify,<br>develop models, algorithmize, manage,<br>organize, plan research processes,<br>carry out evaluation |
| 84% - 70% | good | have good theoretical knowledge in full,<br>understand, independently know how to apply,<br>research, identify, analyze,<br>systematize, categorize,<br>calculate indicators, classify,<br>develop models, algorithmize, manage,<br>organize, plan research<br>processes,evaluate results.<br><br>There may be some errors corrected<br>by the student independently in the course of work (answer , etc.) |
| 69% - 50% | satisfactory | have satisfactory general theoretical knowledge, are able to<br>apply, investigate, identify,<br>analyze, systematize,<br>categorize, calculate indicators,<br>classify, develop models,<br>algorithmize, manage, organize,<br>plan research processes,etc.<br>evaluate results at an average level.<br>Mistakes are allowed that the student finds difficult<br>to correct on their own. |
| 49 % or less | unsatisfactorily | do not have a full amount of general theoretical<br>knowledge, do not know how to independently apply,<br>research, identify, analyze,<br>systematize,categorize,<br>calculate indicators,classify,<br>develop models, algorithmize,manage,<br>organize,plan research<br>processes, evaluate results.<br>Skills and abilities for solving<br>professional tasks are not formed |
| 100% - 50% | credited | indicator characteristics correspond to "excellent",<br>" good","satisfactory" |
| 49 % or less | not credited | indicator characteristics correspond<br>to "unsatisfactory" |

## 7. CONTENT OF THE DISCIPLINE

7.2 Content of practical classes and laboratory work

| |
|---|
| Topic 1. Information technologies: basic concepts, development history and classification (PC-3)<br>Enter, edit, and format text in MS Word. Working with fragments, ways<br>to copy and move information in the text. Tables in MS Word. Sorting of tables and<br>calculations in tables. Create and edit charts in MS Word documents. Apply<br>styles, autotext, autocorrect, and macros in MS Word. Merge documents in MS Word. Insert<br>and edit formulas in MS Word. Insert and edit drawings, diagrams, and drawings in MS<br>Word. Work in the MS Publisher publishing system. Layout of a multi-page publication based on<br>a fixed template. Layout of scientific and technical text. |
| Topic 2. Information technologies of data processing (PC-3)<br>Create, fill in, edit, and format tables in the MS Excel table processor.<br>Formulas, names, and arrays. Formulas over arrays in MS Excel. Boolean variables and functions<br>in MS Excel. Plotting graphs, surfaces, and charts in MS Excel. Use text and<br>calendar functions in MS Excel. Building and processing lists in MS Excel. Consolidate<br>work tables. Pivot tables. Using controls. Elements<br>of decision theory using MS Excel. |
| Topic 3. Information technologies of office automation (PC-3)<br>1. Development of a function for implementing linear and branching algorithms. Development<br>of functions for implementing the simplest cyclic algorithms. Development<br>of integer processing functions. Development of procedures and functions for processing arrays. Development of functions for processing<br>polynomials, vectors, and matrices in VBA. Development of string and text<br>information processing functions in VBA. Development of custom forms in VBA. |
| Topic 4. Information systems: concept, classification and structure (PC-3)<br>1. Fundamentals of the theory of economic information systems. Fundamentals of database design theory<br>. Creating a database in the DBMS. Requests. Designing forms and reports in the DBMS.<br>2. Designing and developing a simple Web site using the HTML language. |
| Topic 5. Reference and legal information systems (PC-3)<br>Work in the legal reference systems Garant and Consultant Plus.<br>Work with reference and regulatory information in the Polygon.Standard. |
| Topic 6. Geoinformation systems (PC-4)<br>Introduction to GIS (MapInfo). Create a new table and manage layers. Registration<br>of topographic maps. Creating graphic objects in a vector layer. Creating a linear<br>vector layer. Creating a point vector layer. Create a map layout and prepare the map for<br>printing. |
| Topic 7. Multimedia technologies (PC-4)<br>Multimedia data. Processing of graphic information in raster and vector graphics<br>editors.<br>Processing audio and video information.<br>General information about designers of presentation materials on the example<br>of LibreOffice Impress Distance education services. The app's interface. Rules for creating presentations.<br>Formatting techniques. |
| Topic 8. Astra Linux operating system (GPC-5)<br>Astra Linux operating system in graphical<br>mode Command line mode Linux OS |

| |
|---|
| Topic 9. UNIX/Linux family file system (Astra Linux) (PC-4)<br>UNIX/Linux family file system (Astra Linux)<br>File. Catalog. A shortcut. File Structure<br>Astra Linux Processes and users<br>Scripts in the Astra Linux operating system |
| Topic 10. Working with text editors in the Astra Linux operating system (PC-4)<br>General information about creating and formatting text documents<br>using the LibreOffice Writer program as an example.<br>Decorative elements of a text document. Creating a table, placing data in a table.<br>Team work on text documents.<br>Features of working with technical texts. Installing and configuring LaTeX<br>Formatting for your own document (term paper). |
| Topic 11. Structuring, storing and processing information in the Astra Linux operating system (PC-4)<br>General information about spreadsheets using LibreOffice Calc as an example.<br>Working with data, formulas and filters, and data visualization.<br>Complex formulas and relationships between tables.<br>Macros. Automating the process of working with the table.<br>Presentation of your own automated data processing system.<br>DBMS interface based on the example of LibreOffice Base.<br>Create tables, import data, and queries.<br>Forms and reports. Types of forms.<br>An application for interacting with databases.<br>A representation of an application that works with databases. Students present their own application "Task Scheduler". |

7.3. Content of independent work

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|---|
| Topic 2. Information technologies of data processing (PC-3)<br>Study of the main and additional literature on the topic. Analysis of laboratory work. Performing practical work. |
| Topic 3. Information technologies of office automation (PC-3)<br>Study of the main and additional literature on the topic. Analysis of laboratory work. Performing practical work.<br>Programming technologies and tools and algorithms. |
| Topic 4. Information systems: concept, classification and structure (PC-3)<br>Study of the main and additional literature on the topic. Analysis of laboratory work. Performing practical work. |
| Topic 5. Reference and legal information systems (PC-3)<br>Study of the main and additional literature on the topic. Analysis of laboratory work. Performing practical work. |

| |
|---|
| Topic 6. Geoinformation systems (PC-4)<br>Creating a base map. Map projections. Displaying spatial data.<br>Creating vector data. Basic operations on vector layers. Creating three-dimensional maps. |
| Topic 7. Multimedia technologies (PC-4)<br>Study graphic editors, sound recording systems, and video editing. |
| Topic 8. Astra Linux operating system (GPC-5)<br>Study of the Astra Linux operating system |
| Topic 9. UNIX/Linux family file system (Astra Linux) (PC-4)<br>Studying the UNIX/Linux family file system (Astra Linux) Processes and users Astra Linux Scenario in the Astra Linux operating system |
| Topic 10. Working with text editors in the Astra Linux operating system (PC-4)<br>Studying materials on working with text editors in the Astra Linux operating system |
| Topic 11. Structuring, storing and processing information in the Astra Linux operating system (PC-4)<br>Studying materials on structuring, storing and processing information in the Astra Linux operating system |

7.3.1. Sample questions for self-preparation for the test/exam
Appendix 1.

7.3.2. Practical tasks in the discipline for self-preparation for the test/exam
Appendix 2.

7.3.3. The list of coursework
is not provided.

7.4. The student's electronic portfolio
is not provided

7.5. Methodological recommendations for completing the control work
are not provided

7.6 Methodological recommendations for completing the course work
are not provided.

## 8. FEATURES OF THE ORGANIZATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE FOR PERSONS WITH DISABILITIES

***At the request of the student***

In order to make the program accessible for persons with disabilities, if necessary, the department provides the following conditions:

- a special procedure for mastering the discipline, taking into account the state of their health;
- electronic educational resources on the discipline in forms adapted to the limitations of their health;
- studying the discipline according to an individual curriculum (regardless of the form of study);
- e -learning and distance learning technologies that provide for the possibility of receiving and transmitting information in forms that are accessible to them.
- access (remote access) to modern professional databases and information reference systems, the composition of which is determined by the discipline's work program.

## 9. LIST OF BASIC AND ADDITIONAL EDUCATIONAL LITERATURE REQUIRED FOR MASTERING THE DISCIPLINE

**Сайт библиотеки USUE Library Website**
http://lib.usue.ru/

**Main literature:**

2. Gagarina L. G., Shevnina Yu. S. The basics of designing and developing information systems [Electronic resource]:Training manual. - Moscow: INFRA-M Scientific Publishing Center, LLC, 2024. - 211-Available at: https://znanium.com/catalog/product/1872684

3. Odintsovo B. E., Romanov A. N., Doguchaeva S. M. Sovremennye informatsionnye tekhnologii v upravlenii ekonomicheskoi deyatel'nosti (teoriya i praktika) [Modern information technologies in economic activity management (theory and practice)].:Training manual. - Moscow: University Textbook, 2024. - 373-Available at: https://znanium.com/catalog/product/2138951

4. Lychkina N. N., Fel ' A.V., Morozova Yu. A., Korepin V. N. Informatsionnye sistemy upravleniya proizvodstvennoi kompanii [Information systems of production company management]. - Moscow: Yurayt Publ., 2024. - 249-Available at: https://urait.ru/bcode/536367

5. Trofimov V. V., Il'ina O. P., Kiyaev V. I., Trofimova E. V. Informatsionnye sistemy i tekhnologii v ekonomiki i upravlenie v 2 ch.Chast 1 [Information systems and technologies in economics and Management in 2 parts]. - Moscow: Yurayt Publ., 2024. - 375-Available at: https://urait.ru/bcode/540772

6. Trofimov V. V., Il'ina O. P., Kiyaev V. I., Trofimova E. V. Informatsionnye sistemy i tekhnologii v ekonomike i upravlenie v 2 ch.Chast 2 [Information systems and technologies in economics and management in 2 parts]. - Moscow: Yurayt Publ., 2024. - 324-Available at: https://urait.ru/bcode/540773

7. Bogatyrev V. A. Informatsionnye sistemy i tekhnologii [Information systems and technologies]. Reliability theory [Electronic resource]: textbook for universities. - Moscow: Yurayt Publ., 2024. - 366-Available at: https://urait.ru/bcode/510320

**Additional literature:**

1. Tsarev R. Yu., Pupkov A. N., Samarin V. V., Mylnikova E. V., Prokopenko A.V. Teoreticheskie osnovy informatiki [Theoretical foundations of informatics]:Textbook. Krasnoyarsk: Siberian Federal University Publ., 2015, 176 p. Available at: <url>. https://znanium.com/catalog/product/549801

2. Yashin V. N. Informatika: programmnye sredstva lichnogo komp'era [Computer science: software for a personal computer ]:Training manual. - Moscow: INFRA-M Scientific Publishing Center, 2018, 236 p. Available at: <url>. https://znanium.com/catalog/product/937489

3. Vavrenyuk A. B., Kurysheva O. K. Operating systems. UNIX Basics [Electronic resource]:Training manual. - Moscow: INFRA-M Scientific Publishing Center LLC, 2021. - 160- Available at: <url> https://znanium.com/catalog/product/1679989

4. Gostev I. M. Osobnye sistemy [Operating systems]:Textbook and workshop for universities. - Moscow: Yurayt Publ., 2022. - 164-Available at: https://urait.ru/bcode/490157

5. Voronov Operating Systems. Tests. Test 1. Operating system, shell, and environment. Compatibility of operating environments [Electronic resource]:. Yekaterinburg: [B. I.], 2023. - 10 – Available at: <url> http://lib.wbstatic.usue.ru/202306c/24.docx

6. Voronov Operating Systems. Tests. Test 2. Operating system components. Process management. Interruptions [Electronic resource]:. Yekaterinburg: [B. I.], 2023. - 9 – Available at: <url> http://lib.wbstatic.usue.ru/202306c/25.docx

7. Voronov Operating Systems. Tests. Test 3. Flow concepts. Planning the processor operation [Electronic resource]:. Yekaterinburg: [B. I.], 2023. - 9 – Available at:<url> http://lib.wbstatic.usue.ru/202306c/26.docx

## 10. LIST OF INFORMATION TECHNOLOGIES, INCLUDING THE LIST ЛИЦЕНЗИОННОГО OF LICENSED SOFTWARE AND INFORMATION REFERENCE SYSTEMS, ONLINE COURSES USED IN THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE

**List of licensed software:**

Astra Linux Common Edition. Contract No. 0417-U / 2019 dated 08.05.2019, Act No. Sk000343 dated 24.05.2019 and Contract No. 35-U / 2018 dated 13.06.2018, Act No . UT213 dated 17.12.2018. The license - is valid for an unlimited period of time.

Microsoft Office 2016.Agreement No. 52/223-PO / 2020 of 13.04.2020, Act No . Tr000523459 of 14.10.2020 License validity period-No time limit.

Microsoft Windows 10 .Agreement No. 52/223-PO / 2020 of 13.04.2020, Act No . Tr000523459 of 14.10.2020. The license - is valid for an unlimited period of time.

Libre Office. The GNU LGPL license. The license - is valid for an unlimited period of time.

**List of information reference systems and resources of the Internet information and telecommunications network:**

Legal reference system Consultant +. Contract No. 143/223-U / 2025 dated 02.12.2025 License validity period until 31.12.2026

31.12.2026 Garant Reference and Legal system . Agreement No. 58419 of 22 December, 2015. The license validity period-no period is unlimited time limit

**Informatics for higher education institutions https://openedu.ru/course/ITMOUniversity/COMTEC**

**Modern information technologies in business**

https://openedu.ru/course/hse/ITBUSINESS/

## 11. DESCRIPTION OF THE MATERIAL and TECHNICAL BASE NECESSARY FOR THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE

The implementation academic of the discipline is carried c out using the material and technical base of USUE, which provides all types of training sessions and research and independent work of students:

Special premises are training rooms for all types of classes, group and individual consultations, ongoing monitoring and interim assessment.

Rooms for independent work of students are equipped with computer equipment with the ability to connect to the Internet and provide access to the electronic information and educational environment of USUE.

All rooms are equipped with specialized furniture and multimedia equipment, special equipment (information and telecommunications, other computer equipment), access to information and search systems, reference and legal systems, electronic library systems, databases of current legislation, and other information resources that serve to present educational information to a large audience.

For conducting lecture -type classes, presentations and other educational and visual aids that provide thematic illustrations.

Appendix 1
to the work program

## 7.3.1. Sample questions for self-preparation for the test/exam

**To be credited**

1. Information, data, and knowledge are basic concepts. Adequacy of information.
2. Information measures. Syntactic measure of information. Entropy of the system.
3. Information measures. Semantic measure of information. A pragmatic measure of information. The concept of "thesaurus".
4. Quality of information. Consumer indicators of information quality.
5. Types of information processes.
6. Encoding when transmitting and storing information. Types of encoding.
7. Classification and structuring of information. Hierarchical classification system.
8. Classification and structuring of information. Faceted and descriptor classification systems.
9. Information society. Information revolutions. Information culture.
10. Information resources, products, and services. Information products and services market. Information market sectors.
11. Knowledge management. A four-layer model of the knowledge management domain. Knowledge management lifecycle model.
12. Knowledge representation models. Semantic networks. Frames. Formal logical models.
13. Knowledge-based systems. Expert systems. Neural networks. Data mining systems. Use-case-based systems. Systems based on genetic algorithms. Intelligent agents.
14. Knowledge engineering: basic concepts, life cycle, and methodology.
15. The concept of information technology. Basic and applied information technologies.
16. Automated office technology. Database technologies.
17. Multimedia technologies: composition, types, and features.
18. CASEtechnologies. BPMN, ARIS, SADT, and UML methodologies.
19. Geoinformation systems and technologies. Information security technologies.
20. Concept and structure of an information system. Supporting IP subsystems.
21. Concept and structure of an information system. Functional subsystems of IP.
22. Types of information systems. ERP, CRM, CSRPsystems, EDMS, and IAS.
23. Databases: basic concepts. DBMS: components, classification, and functions.
24. Data models. Relational data model. Relational databases.
25. Model and modeling: basic concepts. Model parameters. Classification of models and types of modeling.
26. Classification of software by the degree of interaction with the computer hardware.
27. Classification of software by type of licensing, by destination platform.
28. Structure of a personal computer.
29. Programming languages: basic concepts and classification.
30. Data representation form on the computer. General view. Numeric, symbolic, multimedia, and service data.

Appendix 2
to the work program

## 7.3.2. Practical tasks in the discipline for independent preparation for the test/exam

### Sample practical tasks for the test (PC-3. PC-4)

1. Number systems:
   1.1. Convert the number $111.1875_{(10)}$ from decimal to binary, octal, and hexadecimal.
   1.2. Add the numbers $1100110100{,}0011_{(2)}+1101110000.01_{(2)}$
   1.3. Perform subtraction $1001100000_{(2)}-111001000_{(2)}$
   1.4. Perform multiplication of $_{1324.2\,(8)}$* $75.54_{(8)}$
   1.5. Perform division $76C_{(16)}$: $19_{(16)}$
2. Number systems:
   2.1. Convert the number 696.25 from decimal to binary, octal, and hexadecimal.
   2.2. Add the numbers $1001110001.01_{(2)}+1101000111{,}00101_{(2)}$
   2.3. Perform subtraction $111001111_{(2)}-110011100_{(2)}$
   2.4. Perform a multiplication of $_{1210.2\,(8)}$* $5.3_{(8)}$
   2.5. Perform Division $478_{(16)}$ : $16_{(16)}$;
3. Number systems:
   3.1. Convert the number $351.6875_{(10)}$ from decimal to binary, octal, and hexadecimal
   3.2. Add the numbers $101011011{,}011_{(2)}+11100010{,}1_{(2)}$
   3.3. Perform subtraction $1100011001_{(2)}-1010101001_{(2)}$
   3.4. Perform multiplication $113.2_{(8)}$* $60.2_{(8)}$
   3.5. Perform Division $662_{(16)}$ : $13_{(16)}$;
4. Number systems:
   4.1. Convert the number $833.5625_{(10)}$ from decimal to binary, octal, and hexadecimal.
   4.2. Add the numbers $11010001.01_{(2)}+1110110100{,}0011_{(2)}$
   4.3. Perform subtraction $1100001001_{(2)}-110110110_{(2)}$
   4.4. Perform multiplication $231.3_{(8)}$* $120.3_{(8)}$
   4.5. Perform division $888_{(16)}$: $1C_{(16)}$
5. Number systems:
   5.1. Convert the number $398.6875_{(10)}$ from decimal to binary, octal, and hexadecimal.
   5.2. Add up the numbers $101100000{,}1001_{(2)}+110001101{,}01_{(2)}$
   5.3. Perform subtraction $1001110111_{(2)}-1001000110_{(2)}$
   5.4. Perform multiplication $425.2_{(8)}$* $53.1_{(8)}$
   5.5. Perform division $958_{(16)}$ : $17_{(16)}$
6. Number systems:
   6.1. Convert the number $572.25_{(10)}$ from decimal to binary, octal, and hexadecimal.
   6.2. Add the numbers $1111111100{,}11001_{(2)}+1011100{,}01_{(2)}$
   6.3. Perform subtraction $100001100_{(2)}-1000101_{(2)}$
   6.4. Perform a multiplication of $442.7_{(8)}$* $52.2_{(8)}$
   6.5. Perform division $9F6_{(16)}$: $19_{(16)}$
7. Number systems:
   7.1. Convert the number $74.375_{(10)}$ from decimal to binary, octal, and hexadecimal.
   7.2. Add the numbers $1011101011{,}1_{(2)}+1001011100{,}0011_{(2)}$
   7.3. Perform subtraction $1101001011_{(2)}-1001111001_{(2)}$
   7.4. Perform multiplication $1012.52_{(8)}$* $140.6_{(8)}$
   7.5. Perform division $FA0_{(16)}$: $20_{(16)}$
8. Number systems:
   8.1. Convert the number $330.5_{(10)}$ from decimal to binary, octal, and hexadecimal.
   8.2. Add the numbers $1101101111{,}101_{(2)}+1010101100{,}001_{(2)}$
   8.3. Perform subtraction $1010010101_{(2)}-111110001_{(2)}$
   8.4. Perform a multiplication of $_{1515.3\,(8)}$* $115.2_{(8)}$
   8.5. Perform division $855_{(16)}$: $1B_{(16)}$
9. Tasks:
   9.1. Convert 27262976 bits to Mb, Kb, bytes

9.2. Determine the amount of information that is contained on a printed sheet of paper (double-sided printing), if one side can fit 40 lines of 67 characters per line.
9.3. What is the power of the alphabet used to write a message containing 2048 characters, if its volume is 1/512 of one megabyte?

10. Tasks:
10.1. The volume of an information message of 12582912 bits is expressed in kilobytes and megabytes.
10.2. How much information will be contained on a page of printed text when using a 32-character alphabet (60 lines of 56 characters each on a page).
10.3. In Unicode, two bytes are allocated for each character. Determine the information volume of a word of twenty-four characters in this encoding.

11. Tasks:
11.1. Convert 5 Kbytes to bits and bytes
11.2. How many characters are contained in the alphabet used to write a book of 20 pages, each of which contains 15 lines of 20 characters each and takes up the entire book of 5.86 Kb in computer memory.
11.3. How many characters does a message written using the 16-character alphabet contain, if its volume is 1/16 of a megabyte?

12. Tasks:
12.1. Convert 12288 bits to Kb, bytes
12.2. A color bitmap graphic image with a palette of 65,536 colors has a size of 100X100 points (pixels). How much computer video memory (in bytes) does this BMP image occupy?
12.3. An article created using a PC contains 30 pages, 40 lines on each page, and 50 characters in each line. How much information does the article contain?

13. Tasks:
13.1. Convert 106496 bits to Mb, Kb, bytes
13.2. The capacity of the alphabet is 64. How many Kbytes of memory will it take to store 128 pages of text containing an average of 256 characters per page?
13.3. It takes 84,000 bits to store text. How many pages will this text take up if the page contains 30 lines of 70 characters per line?

14. Tasks:
14.1. Convert 40960bit to Mb, Kb, Gbytes
14.2. A 256-character alphabet was used to write the text. Each page contains 32 lines of 64 characters per line. How much information does 5 pages of this text contain?
14.3. How much information does the message contain when a face with the number 3 appears on a six-sided die?

15. Type the following text (MS Word), stretching it to the page and observing all paragraph and character formats: alignment; paragraph spacing; font type, size, and font style; character spacing.
- For all text: Times New Roman font, character size 12 pt, width alignment. For three paragraphs, a sparse 2-pt interval between characters is set.
- Formatting settings for a paragraph starting with the words "Submitted" are as follows: font size 10 pt (all other settings are the same as for the entire text).
- Indent 200 pt before the next paragraph. In the future, the font size is 12 pt.
- Before the paragraph "The book presents..." indent 24 pt.
- Before the paragraph "ISBN 5-09-001292-X..." indent 24 pt, all characters in it are bold.

## Sample practical tasks for the exam (PC-3, PC-4)

16. Type the following text (MS Word), stretching it to the page and observing all paragraph and character formats: alignment; paragraph spacing; font type, size, and font style; character spacing.

17. Type the following text (MS Word), stretching it to the page and observing all paragraph and character formats: alignment; paragraph spacing; font type, size, and font style; character spacing.

- Text title -: font "Times New Roman"; character size 14 pt; bold; center alignment.

18. Type the following text (MS Word), stretching it to the page and observing all paragraph and character formats: alignment; paragraph spacing; font type, size, and font style; character spacing.

19. Type the following text (MS Word), stretching it to the page and observing all paragraph and character formats: alignment; paragraph spacing; font type, size, and font style; character spacing.
    - Text title-font "Times New Roman"; character size 14 pt; bold; center alignment.
    – Some text characters have a different font style than others
    – You can use columns to position tables and text below them.

20. Create and format a table (MS Excel) using table data. Tasks:
    a) Find lenders whose annual interest rate is higher than the average value of this indicator for the entire list.
    b) Find lenders who have taken out a loan for a period exceeding 3 years.
    c) Find the lender that took the smallest loan.
    d) Use conditional formatting to select the maximum and minimum loan amount.
    e) Calculate the total amount of the loan issued at 22% per annum using the function.
    All calculations are performed using Excel functions.

21. Complete the following task in MS Excel. The travel agency "Akademiya-tour" sells trips abroad on the terms shown in the table. Tasks:
    a) The dollar exchange rate is 55.6 rubles. Calculate the cost in rubles.
    b) Find the total profit of the travel agency.
    c) Determine the tour that brings the maximum profit. Using conditional formatting, select it in red.
    d) Calculate the number of air tours.
    e) create and format a chart showing the profit for each round.
    All calculations are performed using Excel functions

22. Complete the following task in MS Excel. Companies "TRACK" and "VECTOR" purchased stationery of seven names in the company "SALYUT". The SALYUT company provides discounts when buying goods for more than 3000 rubles – 5%, and for more than 5000 rubles-7%.
    a) For each company, create and fill in tables containing the following columns: Product name, Price in $, Quantity, Cost in $, Cost in rubles.
    b) Find the purchase amount for each firm.
    c) Determine the amount of discounts using a boolean function.
    d) Design the table, format the column headers.
    e) Determine which firm received the highest discount
    f) Create pie charts showing the share of each product in the total amount for each firm.
    All calculations are performed using Excel functions.

23. Complete the following task in MS Excel. The data shown in the table is available. Tasks:
    a) Calculate income (D), expenses (P) and net profit (P) equal to N=(D-P) (1-N), where N is the income tax calculated by the formula:
    N=20% if the revenue is less than or equal to 500.
    N=30% if the revenue is less than or equal to 1000.
    H=40% if the income is less than or equal to 1500.
    H=50% in all other cases.
    b) Use Conditional formatting to fill in blue cells where the income is greater than 500 and less than 1000.
    c) Calculate revenue from the sale of aspirin.
    d) Create pie charts that reflect the share of each product name in the total sales volume.
    All calculations are performed using Excel functions.

24. Complete the following task in MS Excel. Fill in and format the table.

Create a spreadsheet on sheet 2 that defines the calculation of the quarterly premium according to the following rule:
Based on the calculated average score for the quarter of work performed by employees of the company (s), an increasing coefficient (k) is calculated, which is then multiplied by the minimum bonus (p).
The boost factor is calculated using the following rule:
if 40 ☒ s < 80, then k=2.5,
if 80 ☒ s < 90, then k=3.1,
if 90 < s ☒100 100, then k=4.5
If s<30, then the bonus is not assigned.
Tasks:
˜ Determine the number of employees with an increase factor of more than 90%.
˜ Determine the number of employees with an increase factor of more than 70% (but less than 90%).
˜ Determine the number of employees with an increase factor of more than 50% (but less than 70%).
˜ Determine the number of employees with an increase factor of less than 30%.
˜ Determine the last name of the employee with the highest average score for the quarter of work performed by the company's employees

Audit results

| n / | a Full name | Number of submitted reports, in % | Working out the norm of hours, in % | Assessment of the output of finished products, in % |
|---|---|---|---|---|
| 1. | Makarov S. P. | 80 | 70 | 60 |
| 2. | ... | ... | | |
| 3. | | | | |

25. Develop MS Accessthe Session database in MS Access, which consists of four tables with the following structure: Students-student cipher (key field), last name, first name, patronymic, course, group. Exams – student cipher, date, discipline cipher, grade. Credits – student cipher, date, discipline cipher, credit. Disciplines – code of the discipline (key field) , name of the discipline, number of hours. Establish relationships between tables. Create forms for all tables for data entry.
26. Develop MS Accessthe "Store" database in MS Access, which consists of four tables with the following structure: Products – product code (key field), product name, product quantity. Receipt of goods – product code, date of receipt, purchase price of the product per unit, supplier code. Sale of goods – product code, month of sale, quantity sold for the month, product sale price. Suppliers – supplier code (key field), supplier name, supplier address, supplier phone number. Establish relationships between tables. Create forms for all tables for data entry.
27. Разработайте в среде Use MS Access to develop the Transport Transportation database, which consists of three tables with the following structure: Transport-car brand, state number (key field), fuel consumption. Applications – application code (key field), application date, cargo name, cargo quantity, departure point, destination. Delivery – Item No., date and time of departure, date and time of arrival, application code, state car number, distance traveled. Establish relationships between tables. Create forms for all tables for data entry.
28. Complete the following tasks:
- Create a truth table for the following logical expression:
$( A \text{ Ú } \overline{B} ) \text{ Ù } A \text{ ® } ( \overline{C} \text{ Ú } ( \overline{A} \text{ Ù } C ) )$
- Prove the formula by making up the truth tables:
a ☂ (a ☁ b) = a ☂ b
- Define the values of logical variables A, B, C, Dif:
1) a and (Mars-planet) – true statement.
2) band (Mars-planet) – false statement.
3) with or (the Sun is a satellite of the Earth) – a true statement.
4) dor (The Sun is a satellite of the Earth) – false statement.
29. Complete the following tasks:
- Create a truth table for the following logical expression:
$\overline{(A \vee B) \wedge \left(\overline{B \vee C}\right) \wedge \overline{A}}$ vC
- Prove the formula by making up the truth tables:

(a☂ b) ☔ (a ☂ b) = b

- Define the values of logical variables A, B, C, Dif:
  1) A and "Mercury is a planet" is a true statement
  2) In and "Mercury is a planet" is a false statement
  3) C or "The sun-revolves around the Earth" is a true saying
  4) D or "The sun revolves around the Earth" - a false statement

30. Complete the following tasks:

- Create a truth table for the following logical expression:

$$\left(\left(A \vee \overline{B}\right) \rightarrow B\right) \wedge \left(\overline{A} \vee B\right)$$

- Prove the formula by making up the truth tables:

a ☔ a ☂ b = a ☔ b

- Define the values of logical variables A, B, C, Dif:
  1) A and (Rome is the capital of Italy) - true statement.
  2) B and (Rome is the capital of Italy) - false statement.
  3) C or (47 greater than 29) - true statement.
  4) D or (47 greater than 29) - false statement.