**Module Handbook**

**Degree program**

**5B070300 Information Systems**

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| Module title: | 1. Computer Science and programming bases |
| Module elements | Computer Science  Algorithms, data structures and programming |
| Term of Study: | 1, 2 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Computer Science –Klishina Y. A.  Algorithms, data structures and programming – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  1 semester: hours in a week - 8;  in a semester – 120.  2 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 210 hours  Extracurricular hours: 30 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Algebra and analysis”, “Geometry”, “Computer Science”, “Physics” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  Basics of algoritmization, methods of describing algorithms, algorithmic high-level languages, as well as elements of structured programming, programming in high level language, programming style, methods of design and verification of programs, program design, program debugging, modern programming technology.  ***Skills:***  development of structural schemes of different algorithms, the organization, depending on the requirements of the task of required data structures, program development on the selected programming language;  ***Competencies:***  to be able to search professionally for the necessary information on the internet, the scientific and periodical literature; understanding of central notions of computer science such as “algorithm” and “data processor” in an abstract form that does not involve a specific technical implementation. |
| Contents: | ***Computer Science:***  The main concepts: data and information. Means and methods of data processing. File and file structures. Scale of notation. . The hardware of modern computers. Peripherals. Computer systems software. Modern operating systems. Modern office systems. Multimedia technologies. Computer network and Internet technologies. Servers, browsers, standards and protocols of computer networks. E-mail. Hypertext technology. Computer security and protection. Anti-virus programs.  ***Algorithms, data structures and programming:***  Bases of algorithmization. Algorithmic-level languages. The structure of the program. Elements of structured programming. Development of programs for high-level language. The latest programming technologies. |
| Results of study /examinations /forms of examinations: | ***A complex examination in the module, including***  *Computer Science – computer test*  *Algorithms, data structures and programming – creative examination* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls. |
| Literature: | 1. Setevye tekhnologii, uchebnyj praktikum Solov'eva L.F. Sankt-Peterburg «BVH-Peterburg» 2. Informatika 4-izdanie Stepanov A.N. Spb.- Piter, 2005. – 684 s. 3. Arhangel'skij AYA. Programmirovanie v Delphi 6. M.: ZAO «Izdatel'stvo BINOM», 2001 g. -1120 s: il. 4. D.Gudenko, D.Petrochenko « Sornik zadach po programmirovaniyu» SPb: Piter 2003. -475 s. 5. Kirnos V.P. Praktikum po resheniyu zadach v PASCAL Karaganda, 2005 |

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| Module title: | 2. Foreign language |
| Module elements | Foreign language |
| Term of Study: | 1, 2 |
| Person responsible for the module: | Olkova I.A. |
| Lecturer: | Foreign language – Olkova I.A. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  1 semester: hours in a week - 8;  in a semester – 120.  2 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 90 hours  Extracurricular hours: 180 hours  Total: 270 hours |
| Credits: | 9 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Foreign language” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  phonetic, orthographic, lexical, grammar standards of the studied foreign language;  ***Skills:***  skimming, searching, investigating reading;  dialogic and monologue speech within the topics studied;  translation of professional texts from the foreign in the native language according to the language norms;  listening posts everyday, informative and professional character.  ***Competencies:***  know all kinds of speech activity;  graduates broaden their horizons by taking advantage of offers of mobility integrated in their study programs; extend their foreign language skills. |
| Contents: | Foreign language:  Phonetic, orthographic, lexical and grammatical norms of the studied language.  Phonetics: pronunciation and rhythm and intonation features of a foreign language, reception and reproduction of the sound system of speech. Spelling: basic spelling rules.  Vocabulary: word-formation models, lexical minimum volume of 2,500 units of the base language, as well as the terms corresponding to the profile of specialty; differentiation of vocabulary in the spheres of application.  Grammar: the basic parts of speech - noun, adjective, adverb, verb, article, pronoun, preposition, and the structure of simple and complex sentences, the basic model of word formation |
| Results of study /examinations /forms of examinations: | ***A complex examination in the module, including***  *Foreign language* *– computer test* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Setevye tekhnologii, uchebnyj praktikum Solov'eva L.F. Sankt-Peterburg «BVH-Peterburg» 2. Informatika 4-izdanie Stepanov A.N. Spb.- Piter, 2005. – 684 s. 3. Arhangel'skij AYA. Programmirovanie v Delphi 6. M.: ZAO «Izdatel'stvo BINOM», 2001 g. -1120 s: il. 4. D.Gudenko, D.Petrochenko « Sornik zadach po programmirovaniyu» SPb: Piter 2003. -475 s.   Kirnos V.P. Praktikum po resheniyu zadach v PASCAL Karaganda, 2005 |

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| Module title: | 3. Official language |
| Module elements | Official language |
| Term of Study: | 1, 2 |
| Person responsible for the module: | Zhuanishpaeva S.Zh. |
| Lecturer: | Kazakh language – Zhuanishpaeva S.Zh. |
| Language: | Russian, Kazakh |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  1 semester: hours in a week - 8;  in a semester – 120.  2 semester: hours in a week - 8;  in a semester – 120; |
| Work load: | Curricular load: 80 hours  Extracurricular hours: 160 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Kazakh/Russian language” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  grammatical forms and structures in the communicative, functional aspects; the lexical and terminological minimum on the specialty;  ***Skills:***  reading, listening, note-taking of literature in the specialty in studied language;  drawing up various kinds of scientific and educational texts that are close to the texts of textbooks and lectures, dialogues and monologues on the educational and professional, scientific and professional topics.  ***Competencies:***  graduates broaden their horizons by taking advantage of offers of mobility integrated in their study programs. |
| Contents: | ***Official language:***  Expanding vocabulary minimum of common words and phrases, and mastery of grammatical forms and structures at the level of their use in speech. Acquirement of the lexical and terminological minimum on the specialty. Making various types of speech activity: conversation, description, acquisition. Grammatical forms and constructions in communicative, functional styles.  Adapted reproduction and the production of simple pragmatic texts of dialogue and monologue, orally and in writing on topics relevant to social and professional spheres, according to different types of language skills: speaking, listening, reading and writing |
| Results of study /examinations /forms of examinations: | ***A complex examination in the module, including***  *Official language – cRussianomputer test* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Aldasheva A., Ahmetzhanova Z., Kadasheva K., Sulejmenova EH. Resmi іs kagazdary. «Sozdіk-Slovar'» A., 2002. 2. Aldasheva A., Ahmetzhanova Z., Kadasheva K., Sulejmenova EH. Resmi karym-katynas tіlі: kazak tіlі bagdarlamasy. Astana, 1999 3. Ahmetzhanova Z., Ernazarova Z.Іskerlіk kazak tіlі. Negіzgі dengej. Almaty: «Arhisema» baspasy, 2007. 3. Ayapova T.T., Kuzekova Z.S. kazak tіlі. Almaty, 2002. 4. Bekturova A., Bekturov SH. Kazahskij yazyk dlya vsekh. Almaty: Atamura, 2004. |

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| Module title: | 4. Discrete mathematics and logic |
| Module elements | Logic Discrete mathematics |
| Term of Study: | 2,3 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Logic – Kukharenko E.V.  Discrete mathematics – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  2 semester: hours in a week - 2;  in a semester – 60.  3 semester: hours in a week - 3;  in a semester – 90. |
| Work load: | Curricular load: 50 hours  Extracurricular hours: 100 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained in the study courses such as “Computer science”, “Algorithms, data structures and programming” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  on the latest developments on the study of probabilistic and statistical facilities and the latest technologies for processing information on the basis of the results of studying phenomena;  bases of algorithmization, methods of describing algorithms, high-level algorithmic languages, also elements of structured programming, programming in high level language, style of programming, methods of programs design and verification, program design, debugging of programs, modern programming technologies;  basic systems analysis methods, interpretation of data, analysis and processing by the result of the modeling; modern computational algorithms for solving mathematical problems; basics of MPI and PVM;  ***Skills:***  building of graphic dependences, interpretation of consequences out of economic facts; development of structural schemes of different algorithms, the organization depending on the requirements of the task required data structures, program development on the selected programming language; to own methods of formalized description of information processes and facilities; to use systems analysis in statement and algorithmization of problems of information systems, to define conceptual model of information systems;  the acquisition of the sustainable skill of the highly productive work on the PC as an operator; evaluation of various algorithms of problems solution and choice of the most suitable algorithms for concrete conditions; to use created algorithms on modern high-level languages; to model different systems; to use modern computational algorithms for solving various applied tasks resulting from mathematical modeling of real processes and phenomena, with the subsequent realization of them on a computer;  ***Competencies:***  graduates possess the scientific basis necessary for computer science, in particular knowledge of mathematics, logic; combination of theoretical and methodical skills in making economic decisions; graduate must be acknowledged with the bases of economic analysis and be ready for the implementation of organizational and managerial functions in staff; to be able to search professionally for the necessary information on the internet, the scientific and periodical literature; understanding of central notions of computer science such as “algorithm” and “data processor” in an abstract form that does not involve a specific technical implementation; graduates possess the scientific basis necessary for computer science, in particular knowledge of mathematics, logic, statistics; to possess skills of the use of various techniques of developing the efficient and reliable algorithms on creating software; modeling, analyzing and using the methods of the mathematical design and logical-mathematical methods of analysis and software testing; to be able to program with modern instruments; |
| Contents: | ***Logic:***  Formal and mathematical logic. Propositional calculus. The trueness of the formula of PC. Set theory. The trueness of the formula of the language. Predicate calculus. Recursion theory. Gödel's incompleteness and undecidability of arithmetic theorems.  ***Discrete mathematics:***  Information theory. Introduction to measurement theory. Decision theory. Systems theory. Mathematical formulation of fuzzy logic. Game theory. Basic concepts of graph theory. Fundamentals of artificial intelligence theory. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Abachiev S. K. Formal’naya logika s elementami teorii poznaniya: uchebnik dlya vuzov / S. K. Abachiev. – Rostov-na-Donu: Feniks, 2012. – 635 s. 2. Getmanova A. D. Logika /A. D. Getmanova. — M.: KnoRus, 2012. — 416 s. 3. Demidov I. V. Logika: uchebnik / I. V. Demidov. — 8-e izd. – M.: Dashkov i K, 2013. — 347 s. 4. Dmitrevskaya I. V. Logika / I. V. Dmitrevskaya. — M.: Flinta, 2013. — 384 s. 5. Mikhailov K. A. Logika. Praktikum: uchebnoe posobie dlya bakalavrov / K. A. Mikhailov, V. V. Gorbatov. — M.: Iurait, 2012. — 509 s. |

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| Module title: | 5. Man and society |
| Module elements | Social science  History of Kazakhstan |
| Term of Study: | 1 |
| Person responsible for the module: | Chukhno A.V. |
| Lecturer: | Social science - Chukhno A.V.  History of Kazakhstan - Ibrayev S.I. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  1 semester: hours in a week - 14;  in a semester – 210. |
| Work load: | Curricular load: 70 hours  Extracurricular hours: 140 hours  Total: 210 hours |
| Credits: | 7 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Ethics”, “History of Kazakhstan” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the most important facts, events, phenomena and processes in the history of Kazakhstan on the objective scientific bases;  the place and role of Kazakhstan in the development of the world community;  social structure of community; social contradictions existing in the modern Kazakhstan society;  ***Skills:***  creative mastering of historical material; rethinking of key problems of the History of Kazakhstan using the newest concepts and achievements of the modern historiography;  the collection, processing, interpretation of sociological data and use them in a professional activity;  ***Competencies:***  to be able to use legal and moral-ethical norms in the field of professional activity. |
| Contents: | ***History of Kazakhstan:***  Studying the history of Kazakhstan as the original and simultaneously as an organic part of the world history; Identify the role and place of the Kazakh nation in world community in the diverse stages of formation and development; Showing the basic regularities of ethnical and genetic processes on the territory of Kazakhstan; considering development features of the social and economic relations, key problems of the political history; search the evolution of material and spiritual cultures.  ***Social science:*** The nature of sociological knowledge. Historical stages of formation, trends and prospects of further development of Sociology. Community, social structure, social institutions and processes. |
| Results of study /examinations /forms of examinations: | ***A complex examination in the module, including*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Istoriya Kazahstana. Ocherk. - A., 1993. 2. Sheretov S.G. Novejshaya istoriya Kazahstana (1985-2002 gg.). – A., 2009. 3. Istoriya Kazahstana: narody i kul'tury: Ucheb. posobie / Masanov N. EH. i dr. - A., 2001. 4. Istoriya Kazahstana i Central'noj Azii: Ucheb. posobie / Abuseitova M. X. i dr. - A., 2001. 5. Istoriya Kazahstana. V 5-h tomah. - A., 1996-2011. |

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| Module title: | 6. Algebra and geometry |
| Module elements | Algebra and geometry |
| Term of Study: | 1 |
| Person responsible for the module: | Rabinovich B. V. |
| Lecturer: | Algebra and geometry - Rabinovich B. V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  1 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 120 hours  Extracurricular hours: 0 hours  Total: 120 hours |
| Credits: | 4 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Algebra”, “Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the general theoretical mathematical disciplines “Algebra” and “Geometry”; discrete structure and mathematical logic.  ***Skills:***  tasks solution on mathematical disciplines;  ***Competencies:***  graduates possess the scientific basis necessary for computer science, in particular knowledge of mathematics, logic. |
| Contents: | Algebra and geometry:  Boolean mathematics, discrete mathematics, Matrices and determinants. Systems of linear equations. The scalar, vector, mixed product of vectors. The arithmetic n - dimensional vector space. Linear arithmetic images (straight lines, planes) on the plane and in space. The curves and surfaces of the second order.  The quadratic forms. Elements of Algebra. Complex numbers. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Rabinovich B. V. Kurs lekcij po vysshej matematike dlya special'nosti «Informacionnye sistemy», ch. 1, Petropavlovsk, izd-vo SKGU, 2001g 2. Rabinovich B. V. Kurs lekcij po vysshej matematike dlya special'nosti «Informacionnye sistemy», ch. 2, Petropavlovsk, Izd-vo SKGU, 2004g 3. Zankin S. N., Rabinovich B. V., Sbornik zadach po matematike dlya special'nosti «Informacionnye sistemy», chast' 1 4. Kletenik D. V., Sbornik zadach po analiticheskoj geometrii. Moskva, Nauka, 1972g. |

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| Module title: | 7. Man and environment |
| Module elements | Fundamentals of Life Safety  Ecology and Sustainable Development |
| Term of Study: | 2 |
| Person responsible for the module: | Doskenova B.B. |
| Lecturer: | **Fundamentals of Life Safety** - Doskenova B.B.  **Ecology and Sustainable Development** - Skvortsova E. P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  2 semester: hours in a week - 14;  in a semester – 140. |
| Work load: | Curricular load: 110 hours  Extracurricular hours: 30 hours  Total: 140 hours |
| Credits: | 7 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Biology”, “Geography”, “World history”, “History of Kazakhstan”, “Chemistry”, “Math”, “Physics” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the most important concepts and terms of Ecology and Sustainable development; students get acknowledged with formation stages of ecology as a science, have acknowledgement about the place and the role of Ecology within the system of physical sciences;  ***Skills:***  to establish conformity of natural and anthropogenic pollution areas, and the trouble of the human environment; to apply the comparative method in the analysis of factors of impact on the environment by man; to act in emergency situations, protection of population, organization and carrying out of rescue and other urgent activities;  ***Competencies:***  to be competent in all issues related to the stages of technological processes, labor safety in industry and environmental protection. |
| Contents: | ***Fundamentals of Life Safety:***  The formation at the future specialists theoretical knowledge and practical skills needed to teach the population how to behave in natural, technogenic and social emergency situations, forecasting and making of the educated decisions in emergency situations on protection of the population and the industrial personnel of management facilities and the possible consequences of accidents, catastrophes, disasters, and during the liquidation of these consequences. To teach students the actions in emergency situations, methods of protection of the population, the basics of organizing and conducting of the live-saving and other emergency operations, the basics of medical knowledge.  ***Ecology and Sustainable Development:***  The formation of modern systemic ideas about the basic laws of sustainable development of the nature and society. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Alisheva K.A. Ekologiya: uchebnik. – Almaty: Narpress, 2011. – 342 s. 2. T.A. Hvan, P.A. Hvan. Ekologiya: kratkij kurs. - Rostov-na-Donu: Feniks, 2010. - 188 s. 3. I.A. Shilov. Ekologiya: uchebnik dlya bakalavrov. 7-e izd. - M. :Yurajt, 2012. - 512 s. 4. Vishnyakov Ya.D. Bezopasnost' zhiznedeyatel'nosti. Zashchita naseleniya i territorij v chrezvychajnyh situaciyah: uchebnoe posobie. - M: Akademiya, 2008.-304 s. 5. Ten E.E Osnovy medicinskih znanij. – Moskva: Akademiya -2007. 6. Bezopasnost' zhiznedeyatel'nosti: uchebnoe posobie dlya vuzov/Pod red.L.A.Murav'ya.-2-e izd.pererab. i dop .- M: YUNITI-DANA, 2002.- 431 s. 7. Ushakov K.Z. Bezopasnost' zhiznedeyatel'nosti. – Moskva, 2000. |

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| Module title: | 8. Higher Mathematics and Physics |
| Module elements | Mathematical analysis  Physics |
| Term of Study: | 2 |
| Person responsible for the module: | Rabinovich B. V. |
| Lecturer: | Mathematical analysis - Rabinovich B. V.  Physics - Leontyev P.I. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  2 semester: hours in a week - 20;  in a semester – 300. |
| Work load: | Curricular load: 270 hours  Extracurricular hours: 30 hours  Total: 300 hours |
| Credits: | 10 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Algebra”, “Geometry”, “Physics”, “Algebra and Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the basic concepts and methods of mathematical analysis, definitions, theorems statements, basic formulas; to have an idea about enumerating, logical and geometrical methods of combinatorics, the theory of logical devices and relational schemes; modern physical picture of the world and the scientific worldview;  ***Skills:***  to be able to prove theorems and to apply the results for task solving; to apply the inversion formula, the method of generating functions, the basic concepts of the automata theory and the relational schemes theory; the use of fundamental laws, theories of classical and modern physics.  ***Competencies:***  graduates possess the scientific basis necessary for developing information systems, in particular knowledge of mathematics, logic; be able to evaluate the possibilities of application and apply learned concepts and methods for specific applications solving. |
| Contents: | ***Mathematical analysis:*** Introduction to analysis, differential calculus of functions of one and several variables, integral calculus of functions of one and several variables, differential equations, the theory of series, Fourier series and integrals.  ***Physics:***Mechanics. Kinematics. Waves. Molecular physics and thermodynamics. Statistical physics and thermodynamics. Fundamentals of Thermodynamics. Electricity and Magnetism. Magnetic field. Optics. The concept of radiation (geometric) optics. Quantum physics. The photoelectric effect. Wave-particle duality. Hydrogen atoms and molecules in the quantum theory. Lasers. Elements of quantum statistics. The atomic nucleus and elementary particles. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Kletenik D. V., Sbornik zadach po analiticheskoj geometrii. Moskva, Nauka, 1972g. 2. Trofimova T.I. Kurs fiziki. 2003, Moskva 3. Savel'ev I.V. Kurs obshchej fiziki. T. 1 – 3. 2001, Moskva. |

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| Module title: | 9. Bases of Information Systems |
| Module elements | Bases of Information Systems  Computing practice |
| Term of Study: | 2 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Bases of Information Systems – Kulikov V.P.  Computing practice - Otinova I.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  2 semester: hours in a week - 6;  in a semester – 90. |
| Work load: | Curricular load: 45 hours  Extracurricular hours: 105 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Algebra and Geometry”, “Informatics” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  about the structure of the information process, the foundations of the organization of information processes; to know the basics of system analysis and synthesis of information systems; normative documentation in the specialty; classification of information systems, distinctive features of different types of information systems, the area and features of design and application of information systems’ various types.  ***Skills:***  to own methods of formalized description of information processes and facilities; to use systems analysis in statement and algorithmization of problems of information systems, to define conceptual model of information systems;  the acquisition of the sustainable skill of the highly productive work on the PC as an operator;  ***Competencies:***  to be able to apply the basic principles of complex information systems, which are compatible with the most up-to-date technologies and personal experience of adequate operating such systems;  to be able to solve the problems based on the fact that the systems consist of people, processes, hardware, software and data;  to be able to work with hardware-software complexes of information systems. |
| Contents: | ***Bases of Information Systems:***  Main problems of theory systems. Short historical reference. Terminology of system theory. Concept of information systems. System analysis. Cybernetic approach. Dynamic description of information systems. Canonic concepts of information systems. Aggregate description of information systems. The principle of minimal information communications units. The unit as a random process. Information and Control. Models of information systems. Information models of decision making.  ***Computing practice:***  Solving of typical tasks in the office suites using the built-in functions. |
| Results of study /examinations /forms of examinations: | ***A complex examination in the module, including***  *Bases of Information Systems - computer test*  *Computing practice - assessment* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Glushkov V.M. Osnovy bezbumazhnoj informatiki. M: «Nauka», 1982 – 368 s. 2. Gud G.H., Makol R.EH. Sistemotekhnika. Vvedenie v proektirovanie bol'shih sistem. - M.: Sov. radio, 1962. 3. Ershov A.P. Izbrannye trudy /Pod redakciej prof. I.V. Pottosina. - Novosibirsk, VO Nauka, 1994. 4. Mesarovich M., Takahara YA. Obshchaya teoriya sistem: Matematicheskie osnovy /Per. s angl. pod red. S.V. Emel'yanova. - M.: Mir, 1987. 5. Moroz A.I. Kurs teorii sistem. - M.: Vyssh. shk.,1987. |

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| Module title: | 10. Ethical and legal norms |
| Module elements | Political Science  Basics of Law |
| Term of Study: | 3 |
| Person responsible for the module: | Kaziyev S.Sh. |
| Lecturer: | Political Science – Kaziyev S.Sh.  Basics of Law– Konyrbaeva D.T. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 150 hours  Extracurricular hours: 30 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Bases of Law”, “Bases of Social Science”, “Social Science”, “Human and Society”, “Literature”, “World History”, “History of Kazakhstan”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the basic principles, concepts that are used in the study of political phenomena; basic definitions and categories of sector legislation of Kazakhstan, the modern system of national law and the current legislation of Kazakhstan;  ***Skills:***  to conceptualize contemporary political phenomena and processes, form active citizenship identity of students; to differentiate basic standards institutes of sector legislation of the Republic of Kazakhstan, explain the essence of the socio-legal phenomena, apply the law standards of different branches of the law of the Republic of Kazakhstan in the social and professional life;  ***Competencies:***  to be able to use ethical and legal norms, regulating personal attitudes, the attitude to society and environment. |
| Contents: | ***Political Science:***  The main stages in the development of political science. Politics in the public life. The political system of the society. The state and civil society. Political parties and social movements. Political regimes. Bases of state theory.  ***Basics of Law:***  Bases of the theory of law. Constitutional law of the Republic of Kazakhstan. Bases of Administrative Law of the Republic of Kazakhstan. Civil Law of the Republic of Kazakhstan. Financial Law of the Republic of Kazakhstan. Labor Law of the Republic of Kazakhstan. Criminal Law of the Republic of Kazakhstan. General characteristics of environmental and land rights of the Republic of Kazakhstan. Procedural Law of the Republic of Kazakhstan |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Bulatova A.N., Ismagambetova Politologiya: uch. pos.: Almaty, 2005. 2. Gadzhiev K.S. Politologiya (osovnoj kurs): uchebnik.- M., 2007. 3. Kozyrev G.I. Politicheskaya konfliktologiya: uch. pos.- M., 2008. 4. Politologiya: uchebnik /Avt. A.YU.Mel'vel' i dr.- M., 2010. |

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| Module title: | 11. Philosophy |
| Module elements | Philosophy |
| Term of Study: | 3 |
| Person responsible for the module: | Nikiforov A.V. |
| Lecturer: | Philosophy – Nikiforov A.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 105 hours  Extracurricular hours: 15 hours  Total: 120 hours |
| Credits: | 4 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools in the study courses such as “Human and Society”, “Literature”, “World History”, “History of Kazakhstan”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the scientific worldview based on the study of historical and philosophical material;;  ***Skills:***  to comprehend philosophical phenomena and processes, formation of active citizenship of the personality of students;  ***Competencies:***  to be able to use ethical and legal norms, regulating personal attitudes, the attitude to society and environment. |
| Contents: | ***Philosophy:***  The study of philosophical categories and methodology in the process of improving the historical and philosophical knowledge. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Ableev S.R., Istoriya mirovoj filosofii: uch. pos.: Moskva, 2005. 2. Alekseev P.V., Panin A.V., Filosofiya: 3-e izd., 2009 g. 686 str. |

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| Module title: | 12. Theory of probability and mathematical statistics |
| Module elements | Theory of probability and mathematical statistics |
| Term of Study: | 3 |
| Person responsible for the module: | Chugunova A. A. |
| Lecturer: | Theory of probability and mathematical statistics – Chugunova A. A. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 40 hours  Extracurricular hours: 80 hours  Total: 120 hours |
| Credits: | 4 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 1 course in the study courses such as “Mathematical analysis”, “Algebra and Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  on the latest developments on the study of probabilistic and statistical facilities and the latest technologies for processing information on the basis of the results of studying phenomena;  ***Skills:***  to solve scientific and engineering problems in this area, creating, implementing and maintaining effective use of computers and technology in all spheres of public life connected with the statistical probability-related objects;  ***Competencies:***  to be able to apply the scientific basis necessary for computer science, in particular knowledge of mathematics, logic, statistics. |
| Contents: | ***Theory of probability and mathematical statistics:***  Main concepts and theorems of the probability theory. The sequence of independent trials. The random variables. The limited theorems of the probability theory. Main concepts of the information theory. Main concepts of the random variables. Elements of the random variables theory. Elements of Mathematical statistics. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Vencel' E.S.Teoriya veroyatnostej. M: Fizmatlit, 1962 - 384 str. 2. Gmurman V.E. Rukovodstvo k resheniyu zadach po teorii veroyatnostej i matematicheskoj statistike, M.:Vysshaya shkola , 1979 3. Vencel' E.S, Ovcharov L.A. Zadachi i uprazhneniya po teorii veroyatnostej. M.:Vysshaya shkola , 2002 4. Kremer N.SH. Teoriya veroyatnostej i matematicheskaya statistika M.:YUniti , 2000 |

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| Module title: | 13. Fundamentals of Economic Theory |
| Module elements | Fundamentals of Economic Theory |
| Term of Study: | 4 |
| Person responsible for the module: | Terekhin A. N. |
| Lecturer: | Fundamentals of Economic Theory – Terekhin A. N. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  4 semester: hours in a week - 4;  in a semester – 60. |
| Work load: | Curricular load: 45 hours  Extracurricular hours: 15 hours  Total: 60 hours |
| Credits: | 2 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools and 1 course in the study courses such as “Geography”, “Mathematical analysis” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  economic laws and categories;  ***Skills:***  building of graphic dependences, interpretation of consequences out of economic facts;  ***Competencies:***  combination of theoretical and methodical skills in making economic decisions; graduate must be acknowledged with the bases of economic analysis and be ready for the implementation of organizational and managerial functions in staff. |
| Contents: | Social manufacture and its structure. The forms of social economy. Market: models, structure, kinds. Supply and demand. Competition and Monopoly. Governmental regulation of the economy. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Borisov E. F. Ekonomicheskaya teoriya. - M.: YURAJT, 2005. - 400 s. 2. Kurs ehkonomicheskoj teorii / Pod red. M. N. Chepurina. - Kirov: ASA, 2001. – 752 s.; 3. Ekonomicheskaya teoriya / Pod red. I. P. Nikolaevoj. – M.: YUNITI-DANA, 2008. – 527 s. 4. Ekonomicheskaya teoriya/ Pod red. A. I. Dobrynina SPb.: Piter, 2004. – 544 s. 5. Salimova B.H., Orlova Yu.S., Ramazanova Sh.Sh. Ekonomicheskaya teoriya. Chast' 1- Petropavlovsk: SKGU im. M. Kozybaeva,, 2007. |

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| Module title: | 14. Professional languages |
| Module elements | Profession oriented foreign language  Professional Kazakh (Russian) Language |
| Term of Study: | 3,4 |
| Person responsible for the module: | Shtro O.G. |
| Lecturer: | Profession oriented foreign language – Shtro O.G. Professional Kazakh (Russian) Language - Koshanova Zh. T. |
| Language: | Russian, Kazakh |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 6;  in a semester – 90.  4 semester: hours in a week - 6;  in a semester – 90. |
| Work load: | Curricular load: 150 hours  Extracurricular hours: 30 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in secondary schools and 1 course in the study courses such as “Foreign language”, “Kazakh language”, “Russian language” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  functional and stylistic characteristics of the scientific presentation of the material in the studied foreign language; basis of a business correspondence within the international cooperation; methods of ensuring a reliable and long-term work of the grammatical material of the Kazakh language.  ***Skills:***  to read and translate easily the original literature on the selected specialty, followed by analysis, interpretation and assessment of the extracted information; listening and understanding public performances with the direct and mediated communication; the formation of written and oral skills through communicative activities of students..  ***Competencies:***  ability to use opportunity provided by the Academic mobility center to improve purview; improve the knowledge of foreign and the Kazakh languages. |
| Contents: | Improving proficiency in the English-language speech: improve level of skills of speaking, writing, oral and writing speech, the study of the rules of construction of scientific and professional speech, language features reports and presentations, the study of basic terms in the field of research, strengthening of basic grammatical structures and phenomena.  Profession. Informatics. Information. The diversification of information. Personal computer. Computer. The main blocks of personal computer. Communication through the Internet. The necessity of file archieving. Windows. Computer networks. Multimedia opportunities of computer. Programs. Program equipments. WINDOWS(ХР) operational system. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. D.E. Zemach, L.A.Rumisek. Academic Writing. MacMillan Press, 2006. **2**.Key Concepts in Information and Communication Technology (Palgrave) by Roger I. Cartwright. 2. Holi Roddik Business Writing Makeovers, АСТ, Аstrel, 2004. 3. Aldasheva A., Ahmetzhanova Z., Kadasheva K., Sulejmenova E.H. Resmi іs kagazdary. «Sozdіk-Slovar'» A., 2002. 4. Bekturova A., Bekturov Sh. Kazahskij yazyk dlya vsekh. Almaty: Atamura, 2004 . 5. Kazakstan Respublikasynyn іs kagazdaryn zhurgіzu. Almaty, 2005. 6. Pіrіmbetova M. Іs kagazdaryn kazak tіlіnde zhurgіzu. Oku kuraly. Astana, 2007. |

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| Module title: | 15. Researches and Innovations |
| Module elements | Basics of scientific research organization and innovative activity / Organization of scientific-research activity |
| Term of Study: | 6 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Basics of scientific research organization and innovative activity / Organization of scientific-research activity – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 6;  in a semester – 90. |
| Work load: | Curricular load: 75 hours  Extracurricular hours: 15 hours  Total: 90 hours |
| Credits: | 3 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 1 and 2 courses in the study courses such as “Philosophy”, “Bases of Information Systems” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  modern research methodology; methods of getting, processing and storage of scientific information;  ***Skills:***  to form and solve modern scientific problems, to organize, plan and carry out scientific activity on selected specialty;  ***Competencies:***  ability to use a foreign experience in the chosen field of activity, to analyze own and foreign experiences of development and implementation of information systems; |
| Contents: | Bases of research methodology. The historiography of scientific problems as a result of historical and pedagogical analysis. The language of science: the conceptual apparatus of scientific research. Stages of research. Theoretical and methodological approaches to the study. The organization works with a scientific and educational literature. Internet in the preparation of coursework, thesis and master's thesis. Publication of the results of scientific and educational research. Technique of writing dissertations and master's theses. Guidelines for the defence of the thesis. Consolidation of theoretical knowledge on the example of a particular company or production unit, the expansion and deepening of information on various aspects of their operations. |
| Results of study /examinations /forms of examinations: | ***Creative examination*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Mahanov M.M., Kalanova Sh.M. Osnovy nauchnyh issledovanij v vuzah, metodika napisaniya nauchnyh i metodicheskih rabot, pravila oformleniya: Uchebnoe posobie,- Taraz: TarGU,1999. - 170 s. 2. Kuznecov I.N. Nauchnoe issledovanie. Metodika provedeniya i oformleniya- M.: Dashkov i K – 2007, - 460 s. 3. Ansoff I. Strategicheskoe upravlenie: Per. s angl. / Nauch. Red. L.I. Evenko. M.: Ekonomika, 1989. |

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| Module title: | 16. Preparation for the State Examination |
| Module elements | State Examination in Specialty 5В070300 “Information systems” |
| Term of Study: | 8 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | State Examination in Specialty – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  8 semester: in a semester – 90. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 90 hours  Total: 90 hours |
| Credits: | 3 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students during the whole training period. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  graduates fix and deepen the theoretical knowledge gained during the mastering of the basic educational program of the specialty;  ***Skills:***  graduates fix and deepen the theoretical knowledge gained during the mastering of the basic educational program of the specialty;  ***Competencies:***  ability to solve and evaluate practical tasks using information technologies with regard to technical, ergonomic, economic and social factors |
| Contents: | ***State Examination in Specialty:***  It includes the practical and theoretical questions on subjects studied during the period of training in this specialty |
| Results of study /examinations /forms of examinations: | ***State Examination in Specialty*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | The program of the State Examination in Specialty 5В070300 Information Systems |

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| Module title: | 17. Pre-diploma practice |
| Module elements | Pre-diploma practice |
| Term of Study: | 8 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Pre-diploma practice – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  8 semester: in a semester – 150. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 150 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students during the whole training period |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  graduates fix and deepen practical skills gained during the mastering of the basic educational program of the specialty; demonstration general professional, special and specialized knowledge;  ***Skills:***  graduates fix and deepen practical skills gained during the mastering of the basic educational program of the specialty; carry out activities allowing to collect and summarize the factual material in order to use it in the preparation of the diploma project;  ***Competencies:***  Graduates are familiar with how computer science is applied in practice. They are able to solve and evaluate practical problems using information technologies with regard to technical, ergonomic, economic and social factors. |
| Contents: | ***Pre-diploma practice:*** creation of software and writing of technical documentation for the designed product. |
| Results of study /examinations /forms of examinations: | Pre-diploma practice – assessment |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Methodical guidelines for the production practice for the students of specialty “Information Systems” |

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| Module title: | 18. Writing and defense of Diploma Thesis (Project) |
| Module elements | Writing and defense of Diploma Thesis (Project) |
| Term of Study: | 8 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Writing and defense of Diploma Thesis (Project) – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  8 semester: in a semester – 420. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 420 hours  Total: 420 hours |
| Credits: | 14 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students during the whole training period |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  graduates fix and deepen practical skills gained during the mastering of the basic educational program of the specialty; demonstration general professional, special and specialized knowledge;  ***Skills:***  graduates fix and deepen practical skills gained during the mastering of the basic educational program of the specialty; to apply knowledge for the independent decision of applied tasks in the specialty; to express coherently and well-reasoned one's thoughts, to present and defend one's ideas, suggestions and projects;  ***Competencies:***  Graduates are familiar with how computer science is applied in practice. They are able to solve and evaluate practical problems using information technologies with regard to technical, ergonomic, economic and social factors. |
| Contents: | Writing and defense of Diploma Thesis (Project) |
| Results of study /examinations /forms of examinations: | ***Defence of diploma thesis*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. GOSO RK 5.03.016-2009 Pravila vypolneniya diplomnoj raboty (proekta) v vysshih uchebnyh zavedeniyah. 2. Shevchuk E.V. Kopnova O.L. Metodicheskoe posobie po oformleniyu diplomnyh proektov i rabot dlya studentov special'nostej 091340 «Informacionnye sistemy (po otraslyam i oblastyam primeneniya)», 541530 «Informacionnye sistemy (po otraslyam i oblastyam primeneniya)», 050703 «Informacionnye sistemy», 050111 «Informatika». Petropavlovsk, SKGU im. M. Kozybaeva, 2007. – 51 s. 3. Shevchuk E.V. Kasimov I.R. Metodicheskoe posobie po vypolneniyu kursovyh proektov i rabot. Petropavlovsk, SKGU im M. Kozybaeva 2007. - 28s. 4. Shintemirova A.U., Kadochnikova E.L., Nikishina O.A. Metodicheskoe posobie po raschyotu ehkonomicheskoj ehffektivnosti diplomnyh i kursovyh proektov dlya studentov special'nosti 050703 «Informacionnye sistemy».- Petropavlovsk, SKGU im M. Kozybaeva, 2009. – 77 s. |

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| Module title: | 19. Databases in Information Systems |
| Module elements | Databases in Information Systems |
| Term of Study: | 3 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Databases in Information Systems – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 105 hours  Extracurricular hours: 15 hours  Total: 120 hours |
| Credits: | 4 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 1 course in the study courses such as “Informatics”, “Algorithms, data structures and programming”, “Algebra and Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  the basic discrete structures: sets, relatios, columns, combinatorial structure of approaches to organization of the database; the basic concepts and operations of relational algebra and relational calculus;  ***Skills:***  to perform operations on sets, to apply the set theory device to solve problems, to explore the binary relations on set properties; work with modern DBMS  ***Competencies:***  to be able to apply modern models, methods and technologies of information systems design; the use of discrete mathematics in programming |
| Contents: | Information systems and databases. General information about the data. Concept of construction a database. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. K.Dzh. Dejt «Vvedenie v sistemy baz dannyh» M: SPb.: «Izdatel'skij dom «Vil'yams»», 2000. – 848 s. 2. Rajordan R. «Osnovy relyacionnyh baz dannyh» M.: Russkaya redakciya, 2001 - 384 s. 3. Glushakov S.V., Lomot'ko D.V. «Bazy dannyh: Uchebnyj kurs» M., AST, 2000. - 504 s., ill. 4. Homonenko A.D., Cygankov V.M., Mal'cev M.G. Bazy dannyh: uchebnik dlya vysshih uchebnyh zavedenij. M.: Binom-Press, 2006 – 736 s. |

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| Module title: | 20. Databases |
| Module elements | Database systems / Programming Languages  Study Practice |
| Term of Study: | 4 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Database systems – Kulikov V.P.  Programming Languages – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  4 semester: hours in a week - 12;  in a semester – 180.  Practice - 60 |
| Work load: | Curricular load: 135 hours  Extracurricular hours: 105 hours  Total: 140 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 1 course in the study courses such as “Informatics”, “Algorithms, data structures and programming”, “Algebra and Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  approaches to organize the database; the basic concepts and operations of relational algebra and relational calculus; bases of algorithmization, methods of describing algorithms, bases of programming technologies, the C standard functions, structured programming elements;  ***Skills:***  Work with DBMS Visual FoxPro and MS Access, with query language SQL; evaluation of various algorithms of problems solution and choice of the most suitable algorithms for concrete conditions;  ***Competencies:***  to be able to apply modern models, methods and technologies of information systems design; to have skills of working with hardware-software complexes of information systems; graduates possess a basic understanding that what it consists of and how computers and the main information systems operate such as: operation systems, systems of keeping data, communication systems; to be able to program with modern instruments; |
| Contents: | ***Database systems:***  Information systems and databases. General information about the data. Concept of construction a database. Fundamentals of database theory. The theory of relational databases. Normal forms of relations. Development of a database. Database Design. Automation of database design. Transactions and integrity of databases. Database software.  ***Programming Languages:***  Bases of algorithmization. Methods for describing algorithms. The structure of the programs. Description of data types, the data structures. Major operators of high-level language. Elements of structured programming. Develop programs using modular programming. General information about the object-oriented programming. |
| Results of study /examinations /forms of examinations: | ***Complex exam***  *Database systems / Programming Languages – computer test*  *Study Practice - assessment* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. K.Dzh. Dejt «Vvedenie v sistemy baz dannyh» M: SPb.: «Izdatel'skij dom «Vil'yams»», 2000. – 848 s. 2. Rajordan R. «Osnovy relyacionnyh baz dannyh» M.: Russkaya redakciya, 2001 - 384 s. 3. Glushakov S.V., Lomot'ko D.V. «Bazy dannyh: Uchebnyj kurs» M., AST, 2000. - 504 s., ill. 4. M.V. Kuznecov «S++ master-klass v zadachah i primerah» //Sankt-Peterburg 2007. 5. A.G. Yurkin «Zadachnik po programmirovaniyu» SPb: Piter 2002. -192 s. |

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| Module title: | 21. Programming Technology |
| Module elements | Programming Technology / Databases and knowledge bases |
| Term of Study: | 3 |
| Person responsible for the module: | Kukharenko E.V. |
| Lecturer: | Programming Technology – Kukharenko E.V.  Databases and knowledge bases – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  3 semester: hours in a week - 8;  in a semester – 120. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 1 course in the study courses such as “Informatics”, “Algorithms, data structures and programming”, “Algebra and Geometry” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  bases of programming technologies, the C standard functions, structured programming elements; approaches to organize the database;  ***Skills:***  to record created algorithms on modern high-level languages; work with DBMS MS SQL Server;  ***Competencies:***  to be able to program with modern instruments; to be able to apply modern models, methods and technologies of information systems design; |
| Contents: | ***Programming Technology:***  Description of data types, the data structures. Major operators of high-level language. Elements of structured programming.  ***Databases and knowledge bases:***  Information systems and databases. General information about the data. Concept of construction a database. Fundamentals of database theory. |
| Results of study /examinations /forms of examinations: | ***Complex exam***  *Programming Technology / Databases and knowledge bases – computer test* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. N.A. Litvinenko «Tekhnologiya programmirovaniya na S++. Nachal'nyj kurs» //Sankt-Peterburg 2005, BHV. 2. A.V. Nikulin «Kurs lekcij: Algoritmizaciya i yazyki programmirovaniya» //Petropavlovsk: SKGU im. M. Kozybaeva, 2006. 3. A.G. Yurkin «Zadachnik po programmirovaniyu» //SPb: Piter, 2002. 4. Uchebnyj kurs» M., AST, 2000. - 504 s., ill. 5. Homonenko A.D., Cygankov V.M., Mal'cev M.G. Bazy dannyh: uchebnik dlya vysshih uchebnyh zavedenij. M.: Binom-Press, 2006 – 736 s. 6. Henderson K. Professional'noe rukovodstvo po SQL. SPb: Piter, 2005 – 620 s. |

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| Module title: | 22. Analysis of Algorithms |
| Module elements | Analysis of Algorithms / High-level programming techniques |
| Term of Study: | 4 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Analysis of Algorithms – Kulikov V.P.  High-level programming techniques – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  4 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such “Informatics”, “Algorithms, data structures and programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  bases of algorithmization, methods of describing algorithms, bases of programming technologies, the C standard functions, structured programming elements;  ***Skills:***  to evaluate various algorithms of problems solution and choose the most suitable algorithms for concrete conditions; to record created algorithms on modern high-level languages;  ***Competencies:***  to possess skills of the use of various techniques of developing the efficient and reliable algorithms on creating software; modeling, analyzing and using the methods of the mathematical design and logical-mathematical methods of analysis and software testing; to be able to program with modern instruments; |
| Contents: | ***Analysis of Algorithms:***  Bases of algorithmization. Methods for describing algorithms. The structure of the programs. Description of data types, the data structures. Major operators of high-level language.  ***High-level programming techniques:***  Develop programs using modular programming. General information about the object-oriented programming. |
| Results of study /examinations /forms of examinations: | ***Complex exam***  ***Analysis of Algorithms/High-level programming techniques –*** *computer test* |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. N.A. Litvinenko «Tekhnologiya programmirovaniya na S++. Nachal'nyj kurs» //Sankt-Peterburg 2005, BHV. 2. A.V. Nikulin «Kurs lekcij: Algoritmizaciya i yazyki programmirovaniya» //Petropavlovsk: SKGU im. M. Kozybaeva, 2006. 3. A.G. YUrkin «Zadachnik po programmirovaniyu» //SPb: Piter, 2002. 4. Uchebnyj kurs» M., AST, 2000. - 504 s., ill. 5. Homonenko A.D., Cygankov V.M., Mal'cev M.G. Bazy dannyh: uchebnik dlya vysshih uchebnyh zavedenij. M.: Binom-Press, 2006 – 736 s. 6. Henderson K. Professional'noe rukovodstvo po SQL. SPb: Piter, 2005 – 620 s. |

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| Module title: | 23. Business Administration in Information Systems |
| Module elements | Business Administration in Information Systems / Business Management Information Systems |
| Term of Study: | 4 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Business Administration in Information Systems – Kulikov V.P.  Business Management Information Systems – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  4 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Informatics”, “Algorithms, data structures and programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic definitions and categories of sector legislation of Kazakhstan, on the latest developments on the study of the latest technologies for processing information on the basis of the results of studying phenomena; about the structure of the information process, the foundations of the organization of information processes; to know the basics of system analysis and synthesis of information systems; normative documentation in the specialty; about the functioning and methods of information projects management; in functioning and methods of information projects management; the organizational structure of enterprises;  the main objects and methods of business administration, hardware and software management platform; information management system; organization database administration; programming in systems administration; examples of system administration.  ***Skills:***  to solve scientific and engineering problems in this area, creating, implementing and maintaining effective use of computers and technology in all spheres of public life connected with the statistical probability-related objects; to develop IT strategies; classification and identification of the enterprise as a system;  to possess skills of the use of the functions, procedures and administration services; to apply them for business administration and information systems administration; examples of system administration.  ***Competencies:***  to be competent in all issues related to the stages of technological processes, labor safety in industry and environmental protection; to be able to use ethical and legal norms, regulating personal attitudes, the attitude to society and environment; combination of theoretical and methodical skills in making economic decisions; to be able to search professionally for the necessary information on the internet, the scientific and periodical literature; to own methods of formalized description of information processes and facilities;  to be able to solve the problems based on the fact that the systems consist of people, processes, hardware, software and data;  to be able to apply the methods and technologies of management of design projects and implementation of information systems in business; ability of design, development and marketing of problem-oriented Web-resources; ability to apply the methods of system analysis on a specific enterprise; ability to use a foreign experience in the chosen field of activity, to analyze own and foreign experiences of development and implementation of information systems. |
| Contents: | ***Business Administration in Information Systems:***  Decision-making methods and tools. Organizations and personnel management. Business Economics. Strategic marketing. Corporate Strategy. Organization of data and security. Business analytics  ***Business Management Information Systems:***  Techniques for evaluating the success of project management. Project management procedures. Project management plan. Project management standards. Project management methodologies. Software for project management and project portfolio management. |
| Results of study /examinations /forms of examinations: | ***Complex exam***  Business Administration in Information Systems / Business Management Information Systems |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Arustamov E.A. Osnovy biznesa: uchebnoe posobie / E. A. Arustamov. - Moskva: Dashkov i K, 2013. - 228 s. 2. Kruglova N.IU. Osnovy biznesa: uchebnik dlya vuzov: po special’nosti "Antikrizisnoe upravlenie" / N. IU. Kruglova. - Moskva: Vysshee obrazovanie, 2010. - 542 s. 3. Raizberg B.A. Osnovy biznesa: uchebnik po ekonomicheskim special’nostyam I napravleniyam / IU. B. Rubin. - Moskva: Vjskovskaya finansovo-promyshlennaya akademiya: Market DS, 2009. - 318 s. 4. Rubin, IU.B. Osnovy biznesa: uchebnik: dlya vysshih uchebnyh zavedenii po ekonomicheskim specialnostyam I napravleniyam / IU. B. Rubin. - Moskva: Market DS, 2008. – 318 s. |

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| Module title: | 24. Production practice 1 |
| Module elements | Production practice 1 |
| Term of Study: | 4 |
| Person responsible for the module: | Otinova I.V. |
| Lecturer: | Production practice 1 – Otinova I.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  4 semester: in a semester – 150. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 150 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Informatics”, “Algorithms, data structures and programming”, “Databases”, “Programming Technology” |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  The organizational structure of enterprises  ***Skills:***  Classification and identification of the enterprise as a system  ***Competencies:***  ability to apply the methods of system analysis on a specific enterprise |
| Contents: | Production practice 1: |
| Results of study /examinations /forms of examinations: | ***Complex exam***  Production practice 1 – оценка |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Methodical guidelines for the production practice for the students of specialty “Information Systems” |

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| Module title: | 25. Computer modeling of systems |
| Module elements | Analysis and modeling of systems / Bases of Parallel Programming  Methods of mathematical problems solving using a computer / Systems of computer mathematics |
| Term of Study: | 5 |
| Person responsible for the module: | Pyatkova Т.V. |
| Lecturer: | Analysis and modeling of systems – Pyatkova Т.V.  Bases of Parallel Programming – Kulikov V.P.  Methods of mathematical problems solving using a computer – Kukharenko E.V.  Systems of computer mathematics – Kolyeva N.S. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 18;  in a semester – 270. |
| Work load: | Curricular load: 240 hours  Extracurricular hours: 30 hours  Total: 270 hours |
| Credits: | 9 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic methods of systems analysis, data interpretation, analysis and processing by result of modeling and modern computing algorithms of mathematical tasks solution; bases of MPI and PVM;  ***Skills:***  to model different systems; to use modern computational algorithms for solving various applied tasks resulting from mathematical modeling of real processes and phenomena, with the subsequent realization of them on a computer; to use methods of formalized description of parallel information processes;  ***Competencies:***  to be able to apply modern models, methods and technologies of information systems design; the ability of parallel programming, at both the conceptual level and at the level of practical application, including possession of algorithmic thinking and the ability of developing of a parallel version of the sequential algorithm of solving tasks and their software implementation. |
| Contents: | ***Analysis and modeling of systems:***  Mastering of the theory, methods, and technologies for analysis and systems modeling.  ***Bases of Parallel Programming:***  File systems. Means of file organization and protection. Means and methods of forming and effective work of contemporary operational systems. Contemporary methods and means of parallel programming.  ***Methods of mathematical problems solving using a computer / Systems of computer mathematics:***  Systematization of the forms and concepts of approximate methods for solving applied problems and to prepare students for the development and application of computer-aided numerical algorithms for solving mathematical problems that arise in the process of learning and use in practice, through mathematical modeling. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Modelirovanie informacionno-vychislitel'nyh processov. A.A. Markov, M.,1999. 2. Sovetov B.Ya., Yakovlev S.A. Modelirovanie sistem.- M.: Vysshaya shkola, 2001. 3. Matematicheskie metody i modeli. G.P.Fomin, M.2001. 4. D'yakonov, V. P. Maple 7: ucheb. kurs / V. P. D'yakonov. – SPb.: Piter, 2002. – 666 s. 5. Demidovich, B. P. Osnovy vychislitel'noj matematiki: ucheb. posobie/B. P. Demidovich, I. A. Maron. – M.: Fizmatgiz, 1963. – 660 s. |

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| Module title: | 26. Operating Systems |
| Module elements | Operating systems and Systems Programming / System analysis |
| Term of Study: | 5 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Operating systems and Systems Programming – Kulikov V.P.  System analysis – Pyatkova T.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic methods of systems analysis, data interpretation, analysis and processing by result of modeling and modern computing algorithms of mathematical tasks solution;  ***Skills:***  to model different systems; to use modern computational algorithms for solving various applied tasks resulting from mathematical modeling of real processes and phenomena, with the subsequent realization of them on a computer;  ***Competencies:***  to apply modern models, methods and technologies of information systems designing; to be able to use system concepts to understand and identify the problems; to have knowledge and skills of possession of new information technologies in the field of computer and mathematical modeling of natural-physical, chemical-technological phenomena. |
| Contents: | ***Operating systems and Systems Programming:***  Mastering of the theory, methods, and technologies for analysis and systems modeling.  File systems. Means of file organization and protection. Means and methods of forming and effective work of contemporary operational systems. Contemporary methods and means of parallel programming.  ***System analysis:***  Mastering of the theory, methods, and technologies for analysis and systems modeling. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Modelirovanie informacionno-vychislitel'nyh processov. A.A. Markov, M.,1999. 2. Sovetov B.Ya., Yakovlev S.A. Modelirovanie sistem.- M.: Vysshaya shkola, 2001. 3. Tanenbaum E. «Sovremennye operacionnye sistemy», SPb.: Piter, 2006. 4. Behkon D., Harris T., «Operacionnye sistemy», SPb.: Piter, 2004. 5. Gordeev A.V, «Operacionnye sistemy», SPb.: Piter, 2005. |

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| Module title: | 27. Graphic tools |
| Module elements | Graphic tools of information systems / Designing client-service applications |
| Term of Study: | 5 |
| Person responsible for the module: | Кухаренко Е.В. |
| Lecturer: | Graphic tools of information systems – Кухаренко Е.В.  Designing client-service applications – Куликов В.П. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 135 hours  Extracurricular hours: 15 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic directions of computer graphics’ use; principles of organization and functioning of internet using, bases of interaction of servers and clients, the technology of applications creation on the basis of multi-tier architecture the client-server of database; HTML, CSS, JavaScript;  ***Skills:***  to work with graphical techniques of information systems; designing of web applications with elements of interactive communication with users;  ***Competencies:***  to be able to apply modern models, methods and technologies of information systems design; to have skills of designing of information systems and their elements in concrete fields; skills in the field of geometric modeling; ability to apply practical skills of working in the field of grapho-analytical methods of creating algorithms of information systems. |
| Contents: | ***Graphic tools of information systems:***  Basics of graphics devices and means. Data structures and models. Basic algorithms of computational geometry and computer graphics. The principles for the use of modern graphics systems.  ***Designing client-service applications:***  The principles of organization and functioning of the Internet. Methods of application design. Development of web-pages and the creation of complete websites with interactive elements. The principles of organization and functioning of the Internet, the basics of having servers and clients, technology, building applications based on client-tier architecture - Web-server - the server database. Hypertext Markup Language HTML, Cascading Style Sheets CSS, means of ensuring the dynamics of the language JavaScript. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. M.N. Petrov, V.P. Molochkov. Komp'yuternaya grafika 2-e izdanie. Uchebnyj kurs, 2001. 2. Gurskij Yu., Gurskaya i., Zhvalevskij A. Effektivnaya rabota: tryuki i ehffekty v CorelDRAW 11., 2001 3. Bondarenko S.V., Bondarenko M.YU. 3D Max 7, 2003. 4. Matrosov, Sergeev, Chaunin HTML 4.0, SPb, BHV, 2001. 5. Hol'shlag. Yazyki HTML i CSS, M, Triumf, 2006. |

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| Module title: | 28. WEB-technologies |
| Module elements | WEB-technologies / Computer Graphics |
| Term of Study: | 5 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | WEB-technologies – Kulikov V.P.  Computer Graphics – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 135 hours  Extracurricular hours: 15 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic directions of computer graphics’ use; principles of organization and functioning of internet using, bases of interaction of servers and clients, the technology of applications creation on the basis of multi-tier architecture the client-server of database; HTML, CSS, JavaScript;  ***Skills:***  to work with graphical techniques of information systems; designing of web applications with elements of interactive communication with users;  ***Competencies:***  graduates must know modern models, methods and technologies of information systems design; have skills of designing of information systems and their elements in concrete fields; skills in the field of geometric modeling; apply practical skills of working in the field of grapho-analytical methods of creating algorithms of information systems. |
| Contents: | Basics of graphics devices and means. Data structures and models. Basic algorithms of computational geometry and computer graphics. The principles for the use of modern graphics systems.  The principles of organization and functioning of the Internet. Methods of application design. Development of web-pages and the creation of complete websites with interactive elements. The principles of organization and functioning of the Internet, the basics of having servers and clients, technology, building applications based on client-tier architecture - Web-server - the server database. Hypertext Markup Language HTML, Cascading Style Sheets CSS, means of ensuring the dynamics of the language JavaScript. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. M.N. Petrov, V.P. Molochkov. Komp'yuternaya grafika 2-e izdanie. Uchebnyj kurs, 2001. 2. Gurskij Yu., Gurskaya i., Zhvalevskij A. Effektivnaya rabota: tryuki i ehffekty v CorelDRAW 11., 2001 3. Bondarenko S.V., Bondarenko M.YU. 3D Max 7, 2003. 4. Matrosov, Sergeev, Chaunin HTML 4.0, SPb, BHV, 2001. 5. Hol'shlag. Yazyki HTML i CSS, M, Triumf, 2006. |

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| Module title: | 29. Production practice 2 |
| Module elements | Production practice 2 |
| Term of Study: | 6 |
| Person responsible for the module: | Otinova I.V. |
| Lecturer: | Production practice 2 – Otinova I.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: in a semester – 150. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 150 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  fundamentals of design and development of information systems to solve concrete problems in the enterprise.  ***Skills:***  to design information systems  ***Competencies:***  the ability to apply the methods of development of information systems to solve concrete problems on programming |
| Contents: | Production practice 2: |
| Results of study /examinations /forms of examinations: | ***Complex exam***  Production practice 2 – оценка |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Methodical guidelines for the production practice for the students of specialty “Information Systems” |

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| Module title: | 30. Infrastructure of Computer Systems |
| Module elements | Computer networks / Computer Architecture |
| Term of Study: | 6 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Computer networks – Kulikov V.P.  Computer Architecture – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  classification of computer networks, means and ways to transfer, conversion and presentation of information in networks; architecture of computer systems, memory devices, processing systems;  ***Skills:***  to carry out the installation and configuration of network hardware in modern operating systems; to ensure the assignment of access rights, password protection, and copying the contents of the file system;  ***Competencies:***  to have skills of choice the architecture and interconnecting of hardware of information systems; graduates possess a basic understanding that what it consists of and how computers and the main information systems operate such as: operation systems, systems of keeping data, communication systems. |
| Contents: | ***Computer networks:***  Mastering of the principles of organization and operation of computer networks, the characteristics of the personal computer in the network, familiarity with modern computer network technology and methods of transmission, storage, retrieval, processing and presentation of information, practical skills on local networks.  ***Computer Architecture:***  Bases of computer organization. Presentation of information in the computer. Functional units of computers. Definition, purpose and main features of storage devices (memory) computer. ROM. Computer processors. Organization of input-output. PC interfaces. Basics of PC architecture. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Olifer V.U., Olifer N.A. Komp'yuternye seti. Principy, tekhnologii, protokoly - SP6.: Piter, 2000. - 672s. 2. Guk M. Apparatnye sredstva lokal'nyh setej. Enciklopediya - SP6. Piter. 2000. - 576 s. 3. Arhitektura EVM, V.D. Koldaev 2009g., S.A.Lupin, Moskva, ID «FORUM» - INFRA-M 4. Arhitektura EVM, A.P. Zhmakin, 2006g., Sankt-Peterburg, «BVH-Peterburg». 5. Arhitektura komp'yutera, E. Tanenbaum, 2003g., Sankt-peterburg, «Piter». |

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| Module title: | 31. Computer Architecture |
| Module elements | Architecture of Computer Systems / Systems and networks of information transmission |
| Term of Study: | 6 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Systems and networks of information transmission – Kulikov V.P.  Architecture of Computer Systems – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 12;  in a semester – 180. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  classification of computer networks, means and ways to transfer, conversion and presentation of information in networks; architecture of computer systems, memory devices, processing systems;  ***Skills:***  to carry out the installation and configuration of network hardware in modern operating systems; to ensure the assignment of access rights, password protection, and copying the contents of the file system;  ***Competencies:***  to have skills of choice the architecture and interconnecting of hardware of information systems; graduates possess a basic understanding that what it consists of and how computers and the main information systems operate such as: operation systems, systems of keeping data, communication systems. |
| Contents: | ***Systems and networks of information transmission:***  Mastering of the principles of organization and operation of computer networks, the characteristics of the personal computer in the network, familiarity with modern computer network technology and methods of transmission, storage, retrieval, processing and presentation of information, practical skills on local networks.  ***Architecture of Computer Systems***:  Bases of computer organization. Presentation of information in the computer. Functional units of computers. Definition, purpose and main features of storage devices (memory) computer. ROM. Computer processors. Organization of input-output. PC interfaces. Basics of PC architecture. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Olifer V.U., Olifer N.A. Komp'yuternye seti. Principy, tekhnologii, protokoly - SP6.: Piter, 2000. - 672s. 2. Guk M. Apparatnye sredstva lokal'nyh setej. Enciklopediya - SP6. Piter. 2000. - 576 s. 3. Arhitektura EVM, V.D. Koldaev 2009g., S.A.Lupin, Moskva, ID «FORUM» - INFRA-M 4. Arhitektura EVM, A.P. Zhmakin, 2006g., Sankt-Peterburg, «BVH-Peterburg». 5. Arhitektura komp'yutera, E. Tanenbaum, 2003g., Sankt-peterburg, «Piter». |

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| Module title: | 32. Artificial intelligence systems |
| Module elements | Artificial intelligence systems/System and Network Administration |
| Term of Study: | 7 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Artificial intelligence systems – Kulikov V.P.  System and Network Administration – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  7 semester: hours in a week - 14;  in a semester – 210. |
| Work load: | Curricular load: 195 hours  Extracurricular hours: 15 hours  Total: 210 hours |
| Credits: | 7 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  classifications of artificial intelligence systems, knowledge models, conclusion of solutions and models of communication in artificial intelligence systems; basic concepts about fuzzy sets; about information security and possible security violation; about cryptography and its role in modern information society; in functioning and methods of information projects management;  ***Skills:***  to use of elements of fuzzy sets for mathematical formalization of source information on a studied real situation or decision-making process; symmetric and asymmetric encryption, authorization and authentication;  ***Competencies:***  a graduate is able to create and apply modern technologies in own subject area as well as in adjacent areas; graduates are able on their own to complement and deepen the acquired knowledge and adapt to changes in the studied areas of knowledge; to be able to realize installation, setting and management of system and network software; server and network equipment servicing; |
| Contents: | ***Artificial intelligence systems:***  Knowledge bases and data banks. Model of knowledge representation. The principles of organization and functioning of the systems of artificial intelligence. The design of artificial intelligence systems. Methods of preparation, formalization and structuring of the problem of knowledge, storage and use of knowledge in the knowledge base.  ***System and Network Administration:***  Cryptography. Technology to protect data on a PC. The life cycle of the project. The organization of project management. Methods MSF. Model application development process MSF. Risk management MSF. Principles and methods for evaluating the effectiveness of IT projects. Methods to improve the management of information technology. Model of the production architecture MSF. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Zh.-L. Lor'er, Sistemy iskusstvennogo intellekta, M. Mir, 1999. 2. Aliev R.A. i dr. Proizvodstvennye sistemy s iskusstvennym intellektom./ R.A. Aliev, N.M. Abdikeev M.N. Shahnazarov. M., Radio i svyaz', 1990. 3. Prikladnye nechetkie sistemy: Per. s yapon./K.Asai i dr, M. Mir, 1993. 4. B.Shnajder. Prikladnaya kriptografiya. M.: Izd-vo TRIUMF, 2003 – 816 s. 5. M.Maslennikov. Prakticheskaya kriptografiya. SPb.: BHV-Peterburg, 2003. – 464 s. |

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| Module title: | 33. Information security |
| Module elements | Information security and protection of information / Intellectual information systems |
| Term of Study: | 7 |
| Person responsible for the module: | Kulikov V. P. |
| Lecturer: | Information security and protection of information – Kulikov V. P.  Intellectual information systems – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  7 semester: hours in a week - 14;  in a semester – 210. |
| Work load: | Curricular load: 195 hours  Extracurricular hours: 15 hours  Total: 210 hours |
| Credits: | 7 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  about cryptography and its role in modern information society; in functioning and methods of information projects management; classifications of artificial intelligence systems, knowledge models, conclusion of solutions and models of communication in artificial intelligence systems; basic concepts about fuzzy sets; about information security and possible security violation;  ***Skills:***  symmetric and asymmetric encryption, authorization and authentication; to use of elements of fuzzy sets for mathematical formalization of source information on a studied real situation or decision-making process;  ***Competencies:***  to be able to realize installation, setting and management of system and network software; server and network equipment servicing; a graduate is able to create and apply modern technologies in own subject area as well as in adjacent areas; graduates are able on their own to complement and deepen the acquired knowledge and adapt to changes in the studied areas of knowledge; |
| Contents: | ***Information security and protection of information:***  Cryptography. Technology to protect data on a PC. The life cycle of the project. The organization of project management. Methods MSF. Model application development process MSF. Risk management MSF. Principles and methods for evaluating the effectiveness of IT projects. Methods to improve the management of information technology. Model of the production architecture MSF.  ***Intellectual information systems:***  Knowledge bases and data banks. Model of knowledge representation. The principles of organization and functioning of the systems of artificial intelligence. The design of artificial intelligence systems. Methods of preparation, formalization and structuring of the problem of knowledge, storage and use of knowledge in the knowledge base. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Zh.-L. Lor'er, Sistemy iskusstvennogo intellekta, M. Mir, 1999. 2. Aliev R.A. i dr. Proizvodstvennye sistemy s iskusstvennym intellektom./ R.A. Aliev, N.M. Abdikeev M.N. Shahnazarov. M., Radio i svyaz', 1990. 3. Prikladnye nechetkie sistemy: Per. s yapon./K.Asai i dr, M. Mir, 1993. 4. B.Shnajder. Prikladnaya kriptografiya. M.: Izd-vo TRIUMF, 2003 – 816 s. 5. M.Maslennikov. Prakticheskaya kriptografiya. SPb.: BHV-Peterburg, 2003. – 464 s. |

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| Module title: | 34. Modern Management Methods of Information Projects and Resources |
| Module elements | Management of IT projects/ Management of information resources |
| Term of Study: | 7 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Management of IT projects/ Management of information resources – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  7 semester: hours in a week - 16;  in a semester – 240. |
| Work load: | Curricular load: 225 hours  Extracurricular hours: 15 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  about the functioning and methods of information projects management;  ***Skills:***  to develop IT strategies; to design various types of IS and IS infrastructure.  ***Competencies:***  to be able to apply the methods and technologies of management of design projects and implementation of information systems in business; |
| Contents: | ***Management of IT projects:***  The organization of project management. Methods MSF. Model application development process MSF. Risk management MSF. Principles and methods for evaluating the effectiveness of IT projects. Methods to improve the management of information technology. Model of the production architecture MSF. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Dzh. Lodon, K.Lodon. Upravlenie informacionnymi sistemami, 7-izdanie, Piter, 2005. 2. Baranov V.V., Kalyanov G.N., Popov B.I. Informacionnye tekhnologii i upravlenie predpriyatiem, DMK Press, 2006. 3. Upravlenie proektom. Pod red. M.L. Razu, KNORUS, 2006. |

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| Module title: | 35. Production practice 3 |
| Module elements | Production practice 3 |
| Term of Study: | 8 |
| Person responsible for the module: | Otinova I.V. |
| Lecturer: | Production practice 3 – Otinova I.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  8 semester: in a semester – 240. |
| Work load: | Curricular load: 0 hours  Extracurricular hours: 240 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students during the whole training period |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  fundamentals of design and development of information systems to solve concrete problems in the enterprise.  ***Skills:***  to design and realize information systems  ***Competencies:***  the ability to apply the methods of development of information systems to solve concrete problems on programming |
| Contents: | Production practice 3: |
| Results of study /examinations /forms of examinations: | ***Complex exam***  Production practice 3 – assessment |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Methodical guidelines for the production practice for the students of specialty “Information Systems” |

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| Module title: | 36. Information Management and Quality Management |
| Module elements | Information Management and Quality Management |
| Term of Study: | 5 |
| Person responsible for the module: | Pogrebitskaya M.V. |
| Lecturer: | Information Management and Quality Management - Pogrebitskaya M.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 135 hours  Extracurricular hours: 15 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  management, information management and quality management theory;  ***Skills:***  be able to determine an effective relationship between the individual elements of the information movement process;  ***Competencies:***  be able to apply the international accounting standards. |
| Contents: | ***Information Management and Quality Management:*** Management functions and binding processes. Group dynamics and leadership. Theory of leadership. Fundamentals of quality management. System and process management approaches. The theory of continuous improvement. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Al'bert M., Hedouri F., Meskon M.H. Osnovy menedzhmenta M.: Delo, 2002. - 704 s. 2. Bol'shakov A.V., Mihajlov V.I. Sovremennyj menedzhment: teoriya i praktika. SPb.: Piter, 2002 |

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| Module title: | 37a. Interfaces of Intelligence Systems |
| Module elements | Interfaces of Intelligence Systems |
| Term of Study: | 6 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Interfaces of Intelligence Systems – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 10;  in a semester – 210. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  to know the theoretical bases of construction of system interfaces, models and structures of information networks;  ***Skills:***  construction and maintenance of information and communication systems and networks.  ***Competencies:***  the ability to create and maintain intelligence systems. |
| Contents: | ***Interfaces of Intelligence Systems:***  mastering of the principles of organization and operation of Interfaces of Intelligence Systems, as well as getting practical skills its design, mastering of systematized ideas about the possibilities and spheres of application of Interfaces of Intelligence Systems, its architectural features and the means of their creation. Particular attention is paid to methods of acquisition, formalization and structuring of the problematic knowledge, storage and use of knowledge in knowledge bases. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Lor'er, Zh.L. Sistemy iskusstvennogo intellekta; Mir - Moskva, 2010. - 568 c. 2. Borovskaya E. V., Davydova N. A. Osnovy iskusstvennogo intellekta; Binom. Laboratoriya znanij - Moskva, 2010. - 128 c. 3. Sistemy iskusstvennogo intellekta. Prakticheskij kurs; Binom. Laboratoriya znanij - Moskva, 2011. - 296 c. |

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| Module title: | 38a. Decision support system |
| Module elements | Decision support system |
| Term of Study: | 6 |
| Person responsible for the module: | Shevchuk E.V. |
| Lecturer: | Decision support system – Shevchuk E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  to know the classification of DSS, models of knowledge representation, decision-making and communication models in the DSS; assignment of individual modules of DSS; architecture, principles of construction and operation of DSS;  ***Skills:***  to use the opportunities provided by DSS; to develop scenarios of dialogues based on perception mechanisms for DSS interfaces; to be able to use the tools and technologies of DSS design;  ***Competencies:***  possession of the basic techniques of DSS design; formalization and structuring of the problematic knowledge; to make logical conclusions based on psychological factors; |
| Contents: | ***Decision support system:***  Mastering of the principles of organization and functioning of DSS, as well as getting practical skills of its design, mastering of systematized ideas about the possibilities and spheres of application DSS, its architectural features and the means of their creation. Particular attention is paid to the study of methods of formalization and structuring of problematic knowledge storage and use of knowledge in knowledge bases, designing logical conclusions based on psychophysical factors and their influence on the quality of DSS operation. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Rybina G.V. Osnovy postroeniya intellektual'nyh sistem. — M.: Finansy i statistika; INFRA-M, 2010. — 432 s. 2. Lis'ev G.A., Popova I.V. Tekhnologii podderzhki prinyatiya reshenij. — 2-e izdanie, stereotipnoe. — M.: Izdatel'stvo «FLINTA», 2011. — 133 s. |
| Module title: | 39a. Information-management systems |
| Module elements | Information-management systems |
| Term of Study: | 7 |
| Person responsible for the module: | Nikishina O.A. |
| Lecturer: | Information-management systems – Nikishina O.A. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  7 semester: hours in a week - 16;  in a semester – 240. |
| Work load: | Curricular load: 225 hours  Extracurricular hours: 15 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained in the study courses such as « Interfaces of intelligence systems”, “Decision support system”, “Information management and quality management”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  about information-management systems; understanding of a place and importance of information-management systems in modern organization / enterprise management; principles of information-management systems designing, ability to use them;  ***Skills:***  the use of available information technologies for the creation and presentation of research projects within the course project on the given discipline;  ***Competencies:***  to be competent in the analysis of applying of information-management systems in modern organization/enterprise management; |
| Contents: | Information-management systems:  study of management information systems and the basis of their design to master the practical application skills in the design (modeling) of the information system of the enterprise or organization. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1.T.A.P'yavchenko, V.I.Finaev. Avtomatizirovannye informacionno-upravlyayushchie sistemy. - Taganrog: Izd-vo TRGU, 2007. - 271 s  2. MS Press «Principy proektirovaniya i razrabotki PO. Uchebnyj kurs MSSD» s angl - M: Izdatel'sko-torgovyj dom «Russkaya redakciya», 2010. - 608s.  3. Vendrov A.M. Proektirovanie programmnogo obespecheniya ehkonomicheskih informacionnyh sistem. - M: Finansy i statistika, 2007 |

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| Module title: | 40a. Knowledge base management system |
| Module elements | Knowledge base management system |
| Term of Study: | 5 |
| Person responsible for the module: | Kulikov V.P. |
| Lecturer: | Knowledge base management system – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  5 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 135 hours  Extracurricular hours: 15 hours  Total: 150 hours |
| Credits: | 5 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  about systems of database and knowledge bases;  ***Skills:***  to apply the principles of database administration and control;  ***Competencies:***  the ability to design expert systems, own programming language for designing of expert systems; |
| Contents: | ***Knowledge base management system:***  Familiarization of students with database systems and expert systems, the study data presentation models, languages of database queries, forms of knowledge representation, learning the basics of building expert systems. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Frost R. Proektirovanie i razrabotka baz dannyh. Vizual'nyj podhod. – M: NT Press, 2007. – 592 s. 2. Dzharratino D. Ekspertnye sistemy. Principy razrabotki i programmirovanie. D. Dzharratino, G. Rajli – M.: Vil'yams, 2007. – 1152 s. 3. Sovetov B.Ya. Bazy dannyh: teoriya i praktika : uchebnik dlya vuzov. 2-e izd., ster. – M.: Vysshaya shkola, 2007.–464s. |

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| Module title: | 37b. Design of Web-appendices interfaces |
| Module elements | Design of Web-appendices interfaces |
| Term of Study: | 6 |
| Person responsible for the module: | Kukharenko E.V. |
| Lecturer: | Design of Web-appendices interfaces – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  bases of designing of information systems; computer graphics;  ***Skills:***  to design information systems interfaces;  ***Competencies:***  to be able to design the Web-applications interfaces |
| Contents: | ***Design of Web-appendices interfaces:***  acquaintance of students with computer telecommunications and possible approaches to the development of hypertext documents, intended for publication in global computer Internet network. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Sklyar D., Trahtenberg A. P. Recepty programmirovaniya. 2-e izd.: Per. s angl,M.: Izdatel'stvo “Russkaya redakciya”, 2007 – 736 str. 2. Slepcova L.D., Bidasyuk YU.M. JavaScript. Samouchitel'. M.: Izdatel'skij dom «Vil'yams», 2007 – 448 str. 3. Buch G. Obektno-orientirovannyj analiz i proektirovanie s primerami prilozhe¬nij na C++, - 2-e izd.: Per. s angl. - M.: Binom, SPb.: Nevskij dialekt, 1999. |

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| Module title: | 38b. WEB-programming |
| Module elements | WEB-programming |
| Term of Study: | 6 |
| Person responsible for the module: | Kukharenko E.V. |
| Lecturer: | WEB-programming – Kukharenko E.V. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  6 semester: hours in a week - 10;  in a semester – 150. |
| Work load: | Curricular load: 165 hours  Extracurricular hours: 15 hours  Total: 180 hours |
| Credits: | 6 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in 2 course in the study courses such as “Computer Science and programming bases”, “Databases”, “Analysis of Algorithms”, “Applications Programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic definitions and concepts of Web-design and Web-programming, the basic techniques of creation and promotion of websites; be aware of issues, trends and prospects of development of Web-design and Web-based programming;  ***Skills:***  to design and develop problem-oriented Web-resources; to master methods of design, development and marketing of problem-oriented Web-resources;  ***Competencies:***  ability of design, development and marketing of problem-oriented Web-resources; |
| Contents: | ***WEB-programming:***  Mastering of technologies, principles of organization and functioning of the Internet, training, applications design methods for the use in the Internet environment. Discipline is dedicated to teaching students using the Internet, the development of individual web-pages and the creation of complete websites with elements of interactivity with users, mastering of knowledge about modern methods of creating a presentable text and graphic content by students, the security of dynamics in the work sites, about modern methods of promotion of sites. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Hol'shlag. Yazyki HTML i CSS dlya sozdaniya Web-sajtov, M, Triumf, 2006 2. Reva O.N. JavaScript. Prosto kak dvazhdy dva. M., EHksmo, 2007 3. A.Lomov. HTML, CSS, skripty: praktika sozdaniya sajtov. SPb.,BHV-Peterburg, 2006 |

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| Module title: | 39b. Design of Web-appendices |
| Module elements | Design of Web-appendices |
| Term of Study: | 7 |
| Person responsible for the module: | Kukharenko E.V. |
| Lecturer: | Design of Web-appendices – Kulikov V.P. |
| Language: | Russian |
| Curriculum relation: | 5В070300 Information Systems |
| Mode of study/ number of hours per week and per term: | Full-time mode:  7 semester: hours in a week - 16;  in a semester – 240. |
| Work load: | Curricular load: 225 hours  Extracurricular hours: 15 hours  Total: 240 hours |
| Credits: | 8 ECTS |
| Examination requirements: | To be admitted for the examination the student must have at least 50 out of 100 points assigned for each discipline of the module. |
| Recommended requirements: | This module is based on the knowledge gained by students in the study courses such as “Knowledge base management system”, “Design of Web-appendices interfaces”, “WEB-programming”. |
| Objectives of modules / Intended learning outcomes: | ***Knowledge:***  basic definitions and concepts of Web-design and Web-programming, the basic techniques of creation and promotion of websites;  ***Skills:***  to design and develop problem-oriented Web-resources; ***Competencies:***  ability of design, development and marketing of problem-oriented Web-resources; |
| Contents: | Design of Web-appendices:  Mastering of technologies, principles of organization and functioning of the Internet, training, applications design methods for the use in the Internet environment. Discipline is dedicated to teaching students using the Internet, the development of individual web-pages and the creation of complete websites with elements of interactivity with users, mastering of knowledge about modern methods of creating a presentable text and graphic content by students, the security of dynamics in the work sites, about modern methods of promotion of sites. |
| Results of study /examinations /forms of examinations: | ***Computer test*** |
| Technical/multimedia equipment: | PowerPoint-presentations, multimedia complex, computer halls |
| Literature: | 1. Hol'shlag. Yazyki HTML i CSS dlya sozdaniya Web-sajtov, M, Triumf, 2006 2. Reva O.N. JavaScript. Prosto kak dvazhdy dva. M., EHksmo, 2007 3. A.Lomov. HTML, CSS, skripty: praktika sozdaniya sajtov. SPb., BHV-Peterburg, 2006 |