**AL-FARABI KAZAKH NATIONAL UNIVERSITY**

Approved by University Scientific-methodical Council Session

Minutes, №\_\_\_\_ «\_\_\_»\_\_\_\_2020.

**7B02 − Arts and Humanities**

**7M023 − Languages and Literature, 7M02088 − Interdisciplinary programs related to the arts and humanities**

# EDUCATIONAL PROGRAM

**«7М023 – COMPUTATIONAL LINGUISTICS»**

Аlmaty, 2020

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**PASSPORT**

**ON EDUCATIONAL PROGRAM**

**«7М023 – COMPUTATIONAL LINGUISTICS»**

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| **1. Main characteristics of the educational program** | |
| **Registration number** |  |
| **Code and classification of the field of education** | 7B02 Arts and Humanities |
| **Code and classification of training areas** | 7M023 Languages and Literature, 7M02088 Interdisciplinary programs related to the arts and humanities |
| **Name of educational program** | Computational Linguistics |
| **Availability of application to the license for the direction of training** |  |
| **1.1 Purpose and mission of the EP** | The program is aimed at the formation of a qualified competitive specialist in the field of computational linguistics based on the study of specific modern practical problems of both linguistics proper and information retrieval, machine translation, terminology, linguodidactics, informational problems and other similar studies possessing knowledge in the field of linguistics, mathematics, computer science and being a competitive specialist in various fields of science. |
| **1.2 Main characteristics of EP** | |
| Type of EP: | Master degree |
| Duration of study: | 2 years |
| Mode of education: | Full-time |
| Workload: | 120 credits |
| Degree to award: | Master of Education on educational program **«7М023 – COMPUTATIONAL LINGUISTICS»** |
| Type of EP: | **Innovative EP** |
| **1.3 Description of the advantages and distinctive features of the EP in terms of positioning in the market of educational services** | |
| Distinctive features of EP: | no |
| Presence of accreditation of EP: | no |
| International accreditation: | no |
| National accreditation: | no |
| Name of accreditation body: | no |
| Duration of accreditation: | − |
| According to the rating of educational programs among universities of the Republic of Kazakhstan takes the place: | − |
| NAAR | − |
| IQAA | − |
| Joint of EP | Developed in the framework of the Erasmus + CLASS project “Development of an interdisciplinary master program in computational linguistics in universities of Central Asia”, number: 5585845-EPP-1-2017-1-ES-EPPKA2-CBHE-JP |
| University partner: | University of Coruna (UDC, Spain), Urgench State University (Uzbekistan), Kostanay State University named after A. Baitursynov (KSU), Eurasian National University named after L. Gumilyov |
|  | interdisciplinary |
|  | with integrated training and production modules (dual) |
|  | with English language learning |
|  | polylingual |
| Material and technical base of EP: |  |
| For the implementation of the educational program at the faculty there are laboratories: | «Computer Linguistics» Research Center, «British Center: Language and Culture», Center for Linguistic Expertise, Educational and Experimental Laboratory for «Socio- and Psycholinguistic Research», Center for Francophony, Center for Continuing Education, Center for Russian Language and Culture |
| Personnel potential: |  |
| Number of full-time teaching staff |  |
| Doctors of Sciences | 9 |
| Candidates of Science, PhD | 26 |
| Masters | 2 |
| Base practices: | «Computer Linguistics» Research Center, «British Center: Language and Culture», Center for Linguistic Expertise, Educational and Experimental Laboratory for «Socio- and Psycholinguistic Research», Center for Francophony, Center for Continuing Education, Center for Russian Language and Culture |
| Academic mobility | Utrecht University (Netherlands); Saint Mary's University, (UK); University of Coruna (UDC, Spain); Urgench State University (Uzbekistan); Kostanay State University named after A. Baitursynov (KSU); Eurasian State University named after L.Gumilev |
| Scientific schools or scientific directions of the department, (scientific projects) | «The basic units of the language in a comparative- historical, typological and comparative aspect». |
| Comparison with similar programs of foreign universities | University of Cambridge (QS - 5), University of Wisconsin (QS - 55), Moscow State University M. Lomonosov (QS - 95), Utrecht University (QS - 109), University of York (QS - 135), Higher School of Economics (382) |
| **2. Qualification requirements in form of learning outcomes** | |
| **Expected learning outcomes in EP** | **1.** to demonstrate in-depth knowledge of the methodological foundations of the current state and trends in the development of scientific knowledge in the field of linguistics, computational linguistics, information systems: knowledge of artificial intelligence methods, processing large amounts of data, natural language processing, decision support methods, business intelligence, planning fundamentals scientific research.  **2.** to deepen and expand fundamental and modern knowledge and understand the methodology of linguistic and computational research for independent development and application in scientific research; choose methodologies and technologies for solving emerging problems of mathematical modeling, designing information system applications, network management and information security.  **3.** to identify the main trends in the use of computer technology in linguistics and education; demonstrate knowledge of the current state and trends in the development of human-machine interaction technologies, analysis of data warehouses, languages and programming platforms, machine learning technologies for processing natural languages.  **4.** From the position of the modern approach, critically analyze the functioning scientific concepts and theories in the field of human-computer interaction to determine the object and subject of independent research; develop work plans and programs for research and technical development in the field of design and development of intellectual information systems.  **5.** to integrate the received scientific knowledge into the practice of the educational process, apply modern software and hardware complexes for solving problems in the field of man-machine interaction: designing and developing complex information systems.  **6.** to critically evaluate the latest achievements of theory and practice and determine the specifics of the application in the field of information technology, computer training programs, information retrieval systems, distance education, hypertext technologies, and more; development of information systems.  **7.** to implement and make decisions in the organization and management of expert work in the field of computer technology and linguodidactics.  To possess the main methods, methods and means of receiving, storing, processing information.  Apply methods of mathematical modeling and optimization in order to improve the efficiency of information systems.  **8.**  to choose certain computer technologies necessary for the implementation of independent linguistic research. Analyze the organization's business processes for their effective reengineering by identifying the direction of flow of information.  Competently present the results of independent scientific research in the form of presentations, reports, articles and dissertations.  **9.**  to be able to analytical thinking, logic, juxtaposition and analysis, to scientific substantiation and creative solution of problems in the field of linguistic science.  To master the methods of synthesis and the methods of personal self-expression and self-development. Continue learning independently and improve your professional level.  Integrate knowledge and formulate judgments based on incomplete or limited information about the linguistic and information processes of the organization, predict the future scale of the use of information technologies associated with changes in the volume of information processed.  **10.** to conduct scientific and pedagogical activity, participate in the development of educational and methodological materials for teaching disciplines in the direction of the specialty "Computational linguistics".  **11.** to make your own original contribution to the development of the sphere of computational linguistics, computer and information technologies and systems: prepare, on the basis of the results of completed studies, publications, scientific and technical reports, reviews.  **12.** to analyze information from various sources in global computer networks. Use for their professional purposes the data of related sciences: statistical linguistics, quantitative linguistics, applied linguistics, socio-and psycholinguistics, theory and practice of translation. Formulate and present information, idea, problem and solutions in the field of design and development of information systems to specialists and non-specialists in oral and written form in their native and foreign languages. |
| **2.1 Expected learning outcomes on each EP module** | |
| **Module on history and philosophy of science** | Upon completion of the module, it is expected that undergraduates will be able to:  1. explain the principles of the organization and functioning of science, the genesis and history of science from the standpoint of the formation of its models, images and styles of thinking;  2. to reformulate the main provisions of clearly articulated statements within the limits of the literary norm on the studied topics related to studies, leisure and future profession;  3. select the necessary research methods, modify existing ones and develop new methods based on the objectives of the research in the field of the development of artificial intelligence systems;  4. apply methodological and methodological knowledge in the conduct of scientific research, pedagogical and educational work;  5. analyze and comprehend the realities of modern theory and practice based on the history and philosophy of science, the methodology of natural science, socio-humanitarian and technical knowledge;  6. to interpret the main ideas of clear messages, made in a literary language on various topics arising at leisure, school, work, etc .;  7. to formulate and solve problems arising in the course of research activities and requiring in-depth professional knowledge;  8. discuss, without any difficulty, everyday or professional topics in a foreign language. |
| **Psychology and Pedagogy Module** | Upon completion of the module, it is expected that undergraduates will be able to:  1. explain the psychological patterns and phenomena arising in professional and scientific-pedagogical activities;  2. to organize the learning process on the basis of the credit system of education in higher education;  3. to critically analyze life and professional situations from the point of view of psychology, to see the relationship between behavior and the results of the individual and the collective, resources and development opportunities;  4. apply psychological knowledge to make effective decisions, implement successful communication strategies in personal life and professional activities;  5. effectively use psychological knowledge to develop the potential of oneself and the team;  6. apply traditional and innovative methods and forms of organization of education, new educational technologies in higher education;  7. integrate psychological information about oneself and others into general knowledge and formulate sound judgments;  8. to evaluate the communicative technologies of the subject – subject interaction of the teacher and the student in the educational process of the university, to analyze the system of higher vocational education in Kazakhstan; determine the content of higher education. |
| **Language theory** | Upon successful completion of this module, undergraduates should be able to:  1. to interpret the main linguistic trends in the history of linguistic thought, which together constitute the “portrait” of modern linguistics - sociolinguistics, psycholinguistics, cognitive linguistics, etc.  2. to apply the main components and scientific methods of research of modern linguistics: domestic and foreign;  3. to reproduce conceptually organized philological knowledge as a system of individual quanta in relation to logical correlation, informational complementarity, conceptual integrity;  3. to master the methods of computational linguistics necessary for applied linguistics.  4. to apply fundamental knowledge of general linguistics in the system of native and foreign languages, the structure and functioning of their units in the process of interpersonal and intercultural communication, as well as for working with texts in their specialty in order to form a professional world outlook.  5. ability to update linguistic knowledge in the system through the procedures of formalization, analysis and evaluation (interpretation, systematization, classification, comparison, comparison, etc.) in order to integrate it into the context of personal knowledge.  6. to demonstrate the skills of applying methods in the information space for the application of computer programs and technologies. |
| ***Scientific Paradigms of Linguistics*** | Upon successful completion of this module, undergraduates should be able to:  1. to formulate the role and place of scientific paradigms of general linguistics in the process of formation and development of linguistic science.  2. to reveal and interpret the fundamental laws of the interaction of language and thinking, language and society, language and other semiotic systems, language as a communicative system, the functioning of natural and artificial languages.  3. to test in practice the theoretical knowledge obtained in general linguistics.  4. to compare and correlate scientific paradigms, schools and directions of various periods of the formation of general linguistics.  5. to interpret the causes of transformations in the language under the influence of extralinguistic factors.  6. to demonstrate the specific features of the new methodological approaches in linguistics from the perspective of changing Kazakhstani society, education and science. |
| ***Computational Linguistics*** | Upon successful completion of this module, undergraduates should be able to:  1. to conceptualize and design interdisciplinary knowledge about the scientific paradigms of structural linguistics for use in educational, educational, research, scientific activities ;.  2. Rank search tools (concordancers and corps managers).  3. to relate the fundamental philological knowledge of the alternation of scientific paradigms and methods of linguistic analysis in the basics of natural language processing by means of a computer.  4. to demonstrate skills in working with software tools and information resources of corpus linguistics.  5. to apply the basic mathematical and statistical methods of processing linguistic information and automatic processing of linguistic buildings.  6. to analyze and put into practice standard methods for solving the main types of tasks in the field of information and other applied systems.  7. to carry out search and research on the basis of buildings.  8. to systematize distributed databases and knowledge; to classify and determine the main types of enclosures; explain the essence of the markup procedure and the basic standards for hull marking. |
| ***Language and Informatics*** | Upon successful completion of this module, undergraduates should be able to:  1. to demonstrate knowledge of the theoretical foundations of system modeling, an understanding of the basic principles of experimental research of object models and control systems.  2. to demonstrate knowledge in the design, integration and operation of complex information systems in practice and adapt to new situations.  3. to make a choice of software used in modeling business processes and systems.  4. to perform computational experiments using the studied software, interpret and analyze the results of system modeling.  5. to implement simple simulation algorithms.  6. to use the basic methods of constructing mathematical models of processes, systems, their elements and control systems.  7. to integrate knowledge on system modeling to solve research problems in new information systems.  8. to develop software, manage the process of supporting information systems at all stages of the life cycle within interdisciplinary areas. |
| ***Language and Information Systems*** | Upon successful completion of this module, undergraduates should be able to:  1. to make reasonable judgments about the choice of the type of semantics necessary for specific applications for language technologies.  2. to explain the principles of database design; create database queries.  3. to implement semantic grammar using tools provided by programming languages ​​and / or grammar development systems.  4. to write the rules of semantic interpretation of the main semantic constructions in English and in Kazakh.  5. to master the basics of functional programming and machine learning; know the general sequence of steps in linguistic work; design and implement systems of deep neural networks.  6. to apply acquired programming skills to natural language processing tasks.  7. to use the principles of maintaining integrity and maintaining security in databases.  8. to demonstrate knowledge of the features of the Python programming language.  9. to use Python extension libraries.  10. to write correct programs in the Python programming language. |
| **3. Areas of professional activity of graduates** | |
| **3.1 The planned field of professional activity of the graduate** | Training in the specialty "7M023 - Computational Linguistics" is carried out for the following areas of professional activity:  - research activities;  - pedagogical activity, educational activity;  - organizational and management activities.  For the future employment of graduates of the program, the key employers in the specialty 7M023 - Computational Linguistics are: all secondary schools, colleges, lyceums, gymnasiums, translation centers, financial and state institutions (banks, companies, akimats, etc.) of Kazakhstan and in the partner countries . |
| **3.2 Types of activities (professions) for which the graduate of the EP is mainly preparing** | Master of Arts in the specialty "7М023 - Computational Linguistics" can work as:  - Researcher of research and other organizations of any form of ownership;  - teacher of state and non-state secondary, secondary special and higher educational institutions;  - network application developer;  - network and database administrator;  - IP project manager. |
| **3.3 Analysis and needs of the labor market for graduates of this EP** | The program was developed within the framework of the Erasmus + project on the initiative of Uzbekistan and Kazakhstan.  Potential key employers of graduates of the educational program of the specialty “7M023 - Computational Linguistics” are higher educational institutions of the Republic of Kazakhstan, foreign universities and institutes, research institutes, Nazarbayev intellectual schools, akimats, Ministry of Education and Science of Kazakhstan, Ministry of Culture of Kazakhstan, Ministry of Foreign Affairs of Kazakhstan, national and private television and radio companies, publishing houses, proofreading agencies, etc. |
| **4. Requirements for applicants** | In accordance with the “Model Rules for Admission to Education in Educational Institutions Implementing Educational Programs of Postgraduate Education”, citizens who have mastered professional educational programs of higher education are admitted to the magistracy.  Prior education level - higher basic education (bachelor degree) in the following specialties:  5B011900 – Foreign language: two foreign languages.  5В021000 − Foreign Philology  5В011800 − Russian Language and Literature  5В020700 − Translation Studies  5В020524 − Philology: Russian Language  5В020500 − Philology: Kazakh Language  5В011700 − Kazakh Language and Literature  The applicant must have a document of the state sample of the appropriate level of higher education. An important requirement for the applicant is the knowledge of a foreign (English) language.  The conditions for competitive selection are determined by the university in accordance with the Model Rules for Admission to the Master's Program of Higher Educational Institutions of the Republic of Kazakhstan.  Citizens entering the magistracy pass entrance exams:  1) in one of the foreign languages (English, French, German);  2) by specialty.  Persons who have international certificates confirming the knowledge of a foreign language, not lower than the level specified in the list shall receive the highest score on a 100-point scale of grades:   * English: TOEFL ITP - at least 460 points, TOEFL IBT, threshold score - at least 87, TOEFL threshold score - at least 560 points, IELTS threshold score - at least 6.0; * German: DSH - Niveau C1 / C1 level, TestDaF-Prufung Niveau C1 / C1 level; * French: TFI - at least level B1 in reading and listening sections, DELF, level B2, DALF, level C1, TCF - at least 400 points.   For education on the state educational order are credited to those who scored the highest points in the amount of entrance exams on a 100-point scale: for scientific and pedagogical magistracy at least 150 points, including a foreign language at least 50 points.  In the case of identical indicators of competitive points, the right of first choice for enrollment is given to those who have the highest mark in the specialty, in the case of the same indicators of the entrance examination in the specialty, the right to priority is given to those who have the highest mark in a foreign language. Then the scientific achievements corresponding to the profile of the chosen specialty are taken into account: scientific publications, including in rating scientific journals; certificates of scientific research; certificates for the award of scientific scholarships, grants; certificates / diplomas for participation in scientific conferences and competitions. |

**2.1 Matrix of competences formation on modules of the educational program**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Module Name | Program learning outcomes | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ***Module of the history and philosophy of science*** | А1 | А2 | А3 | В1 | В2 | В3 | В4 | В5 | С1 | С2 | С3 | D |
| ***Psycho-pedagogical module*** |  |  |  |  |  |  |  |  |  | C2 |  | D |
| ***Language Theory*** | A1 | A2 |  | B1 |  |  |  | B5 | С1 |  |  | D |
| ***Scientific Paradigms of Linguistics*** | A1 |  |  | B1 |  |  | B4 |  |  |  | C3 | D |
| ***Computational Linguistics*** | A1 |  |  | B1 |  |  | B4 |  |  |  | C3 | D |
| ***Language and Informatics*** | A1 |  | A3 |  | B2 | B3 |  |  | C1 |  |  |  |
| ***Language and Information Systems*** |  |  | A3 |  | B2 | B3 |  |  | C1 |  |  |  |