70230401 - Computer Linguistics Master's Specialization

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATION OF THE REPUBLIC OFUZBEKISTAN

QUALIFICATION REQUIREMENT

of the Master's Specialization "70230401 - Computer Linguistics"

Tashkent-2024

Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan (MoHESIRU)

Order No. 272

August 01, 2024

DEVELOPED AND INTRODUCED BY:

Tashkent State University of Uzbek Language and Literature named after Alisher Navoiy

APPROVED AND IMPLEMENTED:

Approved by Order No. 277 dated August 01, 2024, of the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan.

IMPLEMENTED BY:

The Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan.

These Qualification Requirements have been developed in accordance with the "State Education Standard of Higher Education. Main Regulations", "Classifier of Fields and Specializations of Higher Education", National and Sectoral Qualification Frameworks of the Republic of Uzbekistan, professional standards, and proposals of personnel employers, and it constitutes an official normative-methodological document.

The right to officially publish the Qualification Requirement on the territory of the Republic of Uzbekistan belongs to the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan.

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1. General Description

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Training of Masters in the master's specialization 70230401 Computer Linguistics is carried out in the full-time form of education. Education in the specialization is organized on the basis of the credit-module system. The normative period of the Master's program is 2 years.

A person who has fully mastered its theoretical and practical classes and successfully passed the final state certification is awarded the qualification (degree) of Master of "Computer Linguist" and official state-pattern document(s) of higher education.

1.1. Scope of Application

1.1.1. Application of the Qualification Requirement

The qualification requirements represent the set of requirements for all higher education organizations training masters in the master's specialization 70230401 Computer Linguistics.

1.1.2. Main Users of the Qualification Requirement:

- Management personnel (Rector, Vice-Rectors, Head of the Academic Department, Deans, and Heads of Departments) and professors-teachers of the higher education organization who are responsible for developing and updating qualification requirements, curricula, and science programs in this master's specialization, effectively implementing the educational process based on them, and who are responsible for the level of preparation of graduates within their competence;

- Students of the higher education organization who master the curriculum and science programs of master's specializations;
- State Certification Commissions evaluating the level of preparation of master's graduates;
- Bodies providing funding to higher education organizations;
- Authorized state bodies conducting accreditation and quality control of the higher education system;
- Personnel customers and employing organizations and enterprises;
- Bachelor's graduates entering higher education organizations and other interested persons.

1.2. Description of Professional Activities

1.2.1. Spheres of Professional Activities:

The master's specialization 70230401 Computer Linguistics is a specialization related to the educational fields of "Computer Linguistics", "Linguistics", and "Fundamentals of Programming". It encompasses the training of professional linguists capable of working effectively in the field of philological, mainly linguistic computer programs and systems aimed at solving language issues, including translation programs, speech recognition systems, Uzbek speech synthesizer, text morphological and semantic analysis programs, creation of linguistic ontologies, formation of electronic dictionaries, production of linguodidactic platforms, creation of language corpora, and improvement of the National Corpus of the Uzbek language; creation of software based on artificial intelligence, natural language processing (NLP), formation of linguistic models, knowledge and practical skills, as well as a complex of abilities to research analysis methods and technologies of polysemantic, polyfunctional, and homonymous words.

1.2.2. Objects of Professional Activities:

- Organizations of the system of relevant ministries;
- International organizations and their representative offices in our republic;
- Software product development companies and internet companies;
- Various state and non-state enterprises;
- Organizations of the higher education system;
- Departments of state and local management bodies;
- Academic, scientific-research, and institutional organizations related to scientific, technical, and technological issues;
- Tourist information centers;
- Republican state and non-state publishing and printing houses;
- Information retrieval systems in "Electronic Government";
- State and private companies producing linguistic components of information systems (information retrieval field, intelligent systems, machine translation, e-learning, automatic speech analysis and synthesis algorithms, organization of social networks);
- Linguistic expertise departments of various institutions and departments;
- Vocational colleges, academic lyceums, and higher education institutions.

1.2.3. Types of Professional Activities

- Software development activity;

- Scientific-research activity;
- Organizational-management activity;
- Scientific-pedagogical activity in higher, advanced training, and retraining educational institutions, and pedagogical activity in specialized secondary and vocational educational institutions (in the established order);
- Specific types of professional activities of masters trained in the specialization are determined by the higher education institution in cooperation with the interested participants of the educational process.

1.2.4. Professional Tasks.

In accordance with the 7th qualification level of the National Qualifications Framework for the specialization 70230401 Computer Linguistics and the spheres, objects, and types of professional activities of the master, the master's graduate must be capable of performing the following professional tasks:

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In software development activity:

- To master the methods of creating linguistic software and use them effectively;
- To have detailed information about linguistic software and utilize them effectively in professional activity;
- To develop and use a system suitable for the field in scientific and practical activities;
- Must know how to comply with the code of professional ethics.

In scientific-research activity:

- Organization of scientific activity;
- Conducting scientific, practical research, analyzing experimental results, and drawing scientifically grounded conclusions based on them, discovering scientific innovations;
- Preparation and editing of scientific articles, reports, monographs, educational literature, development of scientific reviews on the topic of ongoing research, compilation of abstracts and bibliographies;
- Purposeful searching and finding of information on the latest scientific, design, and technological achievements in scientific literature and the Internet;
- Must develop conceptual and theoretical models of scientific projects, scientific problems being solved, and tasks on the topic of the corresponding specialization.

In organizational-management activity:

- Organization and management of production;
- Organizing, conducting, and actively participating in scientific seminars, conferences, and symposia;
- Project management, planning production processes and resources, analyzing risks that may occur unpredictably, having the ability to manage a project team;
- Having the ability to organize corporate training based on e-learning and m-learning technologies and to develop a corporate database.

In scientific-pedagogical activity in higher, advanced training, and retraining educational institutions, and in pedagogical activity in specialized secondary and vocational educational institutions (in the established order):

- Having the ability to conduct theoretical, practical, and laboratory classes, including in educational workshops, in educational disciplines provided for in the direction of preparation related to the specialization in educational institutions of higher, specialized secondary, and vocational education systems;
- Mastering the methodology of teaching educational disciplines;
- Having the ability to conduct non-traditional educational sessions using modern information and pedagogical technologies, and technical means of teaching in the educational process;

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- Having the ability to compile, prepare, and formalize educational-methodological documents necessary for conducting lessons in the taught disciplines;
- Having the ability to use technical means of teaching to conduct sessions in the taught discipline;
- Having the ability to systematically improve oneself in the field of the taught discipline, methods, tools, and other areas of pedagogical activity as a result of independent education and creative search;
- Conducting pedagogical and educational-methodological activity in accordance with the specialization in higher education, retraining, advanced training, and professional educational institutions;
- Perfectly mastering electronic (e-learning), mobile (m-learning), and distance information technologies and educational-methodological complexes;
- Systematically increasing one's pedagogical and scientific skill and qualification;
- Must possess the skills to develop State Educational Standards, qualification requirements, and other educational-normative documents of the continuous education system.

2. Requirements for Professional Competences

- Must possess a system of knowledge related to the scientific world outlook, know the fundamentals of general methodological sciences, and current issues of state policy;
- Must have the ability to independently analyze social problems and processes;
- Must understand the essence of documents and works related to professional activity in one of the foreign languages, know the methodology of scientific research and pedagogy, and be able to use it on a modern scientific basis in professional activity;
- Must be able to independently acquire new knowledge, work on oneself, and organize one's work on a scientific basis;
- Must be able to creatively and critically review and analyze acquired knowledge, and use them in scientific activity;
- Relying on one's individual knowledge, must understand and analyze problems of social and personal significance;
- Must be able to use normative-legal documents in one's activity, and make reasoned independent decisions in one's professional activity;

- Must possess the main methods and tools of obtaining, storing, and processing information from the Internet, and have skills of working with a computer as an information management tool;
- Must be able to use information technologies, understand the essence and significance of information technologies in the conditions of an information society, realize the danger of information attacks and threats, and have the ability to comply with the main requirements of information security;
- Must be able to prepare normative documents for obtaining a patent or copyright certificate;

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- Must possess skills of project preparation for participation in projects announced by state, non-state, and non-profit organizations.
- Must have an idea about the essence of scientific-pedagogical research, descriptions given to research, research strategies and ways and methods of choosing them, qualitative and quantitative-based research and their specific characteristics, ways and methods of choosing a problem, the essence of statistical analysis, statistical analysis programs, descriptive statistics, transformational analysis, correlation, and also new information related to computer linguistics education;
- The master's student must possess skills in formulating a research topic, choosing a scientific research method suitable for the topic, preparing a justification for a scientific research topic, and working with scientific literature;
- Must possess skills in conducting scientific and practical research, processing experimental results and drawing scientifically grounded conclusions based on them, preparing and editing scientific articles, organizing and conducting scientific seminars, conferences, and symposia, and developing scientific projects;
- Must possess skills in understanding the specific norms of the literary language and distinguishing it from dialects;
- Independently acquiring modern knowledge related to methodology and linguodidactics, predicting methodical problems and finding solutions;
- Must know how to improve the database of the National Corpus of the Uzbek language being created, know how to create its lexicographic database, be able to tokenize texts for language corpora databases, be able to tag parts of speech, and possess the skill to create private language corpora;
- Must possess the skill of natural language processing of texts for production and practical activity purposes (linguistic tagging, writing formal lexical explanations, annotation, and abstracting, i.e., bringing a large-volume text into a compact small volume while preserving its content);
- Must know the creation and improvement of linguistic and cognitive components of information and intelligent systems for various purposes (thesaurus, linguistic ontologies, databases, knowledge bases, syntactic analysis systems - parsers, semantic analysis programs, morphoanalyzers);
- Must know the development and improvement of linguistic resources (text corpora, dictionaries, phonetic, lexical, terminological databases);
- Be able to develop and implement an oral, written, and automatic translation system in practice using computer systems, be able to apply automatic translation tools, analyze and research machine translation theory, possess the skill to create and improve linguistic support and databases, software of translation programs, know how to use parallel corpora and create their knowledge and databases;

- Be able to proficiently translate texts from foreign languages into state and official languages, and from state and official languages into foreign languages;
- Be able to identify current issues and provide solutions regarding modern programs processing natural language;

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- Must develop linguistic components of automatic natural language processing systems (synthesis and recognition of oral speech, text generation, automatic translation, automatic abstracting, and annotation), and intelligent systems;
- Be able to use mathematical foundations in formalizing linguistic knowledge and be able to analyze and synthesize linguistic structures and linguistic knowledge;
- Be able to perform computer lexicography tasks: know how to create an electronic dictionary database, create a new generation of electronic dictionaries, and mobile applications of linguistic dictionaries;
- Know how to prepare language models and resources, model natural language for artificial intelligence, and be able to apply it to practice;
- Be able to create electronic systems providing for automatic processing of voice speech and written texts in natural language;
- Know the Python programming language, be able to work in databases (SQL, MySQL, Oracle, etc.);
- Know how to create operational formal models of the language system that correspond to natural language processing tasks such as intelligent search;
- Know how to widely use methods such as machine learning, automatic linguistic annotation, syntactic and semantic analysis of text;
- Must possess the qualification to create linguistic and software support, databases for speech recognition and synthesis, machine translation, text understanding, and semantic analysis programs;
- Be able to independently perform projects, participate in their execution, know how to design current issues, be able to conduct laboratory classes on IT, and be able to analyze data;
- Must have the ability to organize the teaching of taught languages in an accelerated method and to organize services.

3. Requirements for Internships

Scientific-pedagogical internship is aimed at consolidating theoretical knowledge from general professional and specialization disciplines and harmonizing them with practical production processes, forming corresponding practical skills, competences, and qualifications.

A scientific-pedagogical internship is conducted in the master's specialization.

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4. Structure of the Catalog of Disciplines

Qualification Code	Names of educational disciplines, blocks and types of activities	Total workload, hours	Credit amount	Semester
1.00	**Compulsory Disciplines**			
1.01 ITM 104	Methodology of Scientific Research	120	4	1
1.02 MFO'M 304	Methodology of Teaching Special Disciplines	120	4	3
1.03 TTQI 105	Natural Language Processing (NLP)	150	5	1
1.04 KL 1-2 10	Corpus Linguistics	300	10	1,2
1.05 PDT 1-2 10	Python Programming Language	300	10	1,2
1.06 MBDM 1-3 14	Databases and Data Mining	420	14	1,2,3
	Total:	**1410**	**47**	
2.00	**Elective Disciplines**	**390**	**13**	**2,3**
2.00	Elective Disciplines (3 disciplines)	390	13	2,3

Qualification Code	Names of educational disciplines, blocks and types of activities	Total workload, hours	Credit amount	Semester
	Qualification: digital linguist, pedagogue-researcher			
3.00	**Scientific Activity**	**1800**	**60**	**1,2,3,4**
	TOTAL	**3600**	**120**	

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Bibliographic Data

Keywords:

Type of professional activity, competence, object of professional activity, sphere of professional activity, curriculum and science program of master's degree (master's program), profile, educational period, scientific-research process, artificial intelligence, computer linguistics, lexical-semantic group, corpus linguistics, social networks, ontologies, computer semantics, morphological models, electronic dictionaries, automatic text translation, information-communicative systems, modern research methods, information and modern pedagogical technologies, models and modeling, science working programs, organization of scientific research, virtual electronic knowledge sources, didactics, theory.

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(Page 12 contains images of official stamps and signatures of the agreement sheet)

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Developers, agreed main related higher education institutions, and consumers of personnel.

DEVELOPED:

Tashkent State University of Uzbek Language and Literature named after Alisher Navoiy

Rector: Sh. Sirojiddinov

(Official Stamp / Signature)

Year 2024

AGREED:

Research Center for Development of Higher Education under the Ministry of Higher Education, science and innovation of the Republic of Uzbekistan

Director: M. Boltaboyev

(Official Stamp / Signature)

Year 2024

Uzbekistan State University of World Languages

Rector: I. Tuxtasinov

(Official Stamp / Signature)

Year 2024

"KEEP PRINT" LLC

Director: A. Narzulloyev

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