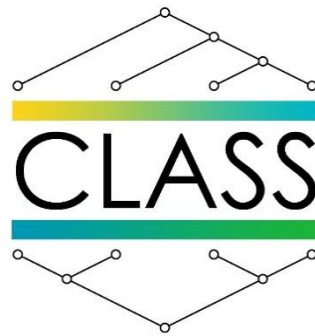




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*Development of the interdisciplinary master program on Computational Linguistics at Central  
Asian universities*

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# Qualification Description

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## Preliminary Note

The qualification description should ideally reflect the interdisciplinary nature of the proposed Master's programme, combining input from faculties or departments of Computer Science with input from the Humanities, specifically Linguistics. However, given the fact that few universities, for largely bureaucratic reasons, find it easy to create such an interdisciplinary course, the decision was taken to propose the following:

1. Qualification Description 1 – for an interdisciplinary course with input from Computer Science and Linguistics faculties or departments
2. Qualification Description 2 – for Computer Science faculties or departments
3. Qualification Description 3 – for Linguistics faculties or departments

PLEASE NOTE: The CA universities will have to adapt the section on Admission and introduce practical information on topics such as duration, location, required technology and books, accommodation, fees, and other information.

## 1. Qualification Description 1 - for an interdisciplinary course with input from Computer Science and Linguistics faculties or departments

### 1.1 General introduction

This Masters' program is innovative and ambitious, and is the first initiative of its kind in the Uzbek and Kazakh universities.

It is ambitious because it aims to have a large positive impact on the Kazakh and Uzbek societies. By providing students with a good foundation in computational and linguistic resources, they can apply this knowledge to strengthen the Kazakh (KZ) and Uzbek (UZ) languages, creating tools and resources that will allow for better communication within their countries, as well as multilingual tools that can foster international communication. It is innovative because it will involve cooperation in planning the course between international and national universities, cooperation between the teachers at these universities in the implementation of the course modules, and cooperation between students and teachers in the research projects that will be developed.

The primary objective of this course will be to train professionals who will be able to develop resources and tools, and these resources and tools will in turn be useful to the community of speakers of these languages. Graduates will be in a position to work on future university research projects, as well as projects involving human language technologies in public, industrial, and commercial institutions.

The teaching methodology is innovative. The emphasis will be on interdisciplinary cooperation that will be facilitated by blended learning methodologies, mixing traditional

methods with virtual or online learning. These methods will encourage students to develop both their personal and autonomous learning skills as well as their ability to network successfully and work in teams.

The interdisciplinary focus will mean that the students from both the computational and the linguistic sciences will be encouraged to apply for this Masters. There will be some core modules, but two parallel paths: one for students with a background in computer science – who will attend compensatory modules in linguistics, the other for students with training in language(s) and linguistics – who will need compensatory modules in statistics and programming. Besides, since the success of the Masters requires cooperation, every opportunity will be provided for the students from both paths to work together on interdisciplinary group projects.

## 1.2 Admission

Students applying for this Masters program should have a first degree in Computer Science or Linguistics and Language.

## 1.3 Objectives

- To train a group of future professionals in the areas of computational linguistics (CL), natural language processing (NLP), and human language technologies (HLT);
- To train these future professionals to work as teams on interdisciplinary projects;
- To develop the students' capacity for autonomous study through blended learning;
- To train a group of future professionals to develop, use, and improve:
  - Digital language resources in KZ and UZ: e.g. dictionaries, terminology databanks; Wordnets for KZ and UZ, and ontologies of more technical and scientific language; and corpora – written, spoken and multimedia;
  - Annotation tools for morphological and syntactic analysis of KZ and UZ;
  - Spelling checkers, grammar checkers, style checkers and predictive writing for use with word-processing programs and social media apps in KZ and UZ;
- To train future professional translators and interpreters in various forms of translation technology - CAT (computer assisted translation) tools, such as translation memories, terminology databanks, and machine translation;
- To prepare students for research into machine translation, information retrieval, text mining, data mining, sentiment analysis, opinion mining, question answering (QA), and other areas;
- To prepare students for research into speech technology.

## 1.4 Learning Outcomes

### 1.4.1 General skills

On graduation students should be able:

- To work in interdisciplinary teams;

- To study autonomously using blended learning;
- To understand the importance of studying natural languages;
- To develop KZ/UZ language resources and tools;
- To use these resources and tools to study the KZ/UZ languages and promote knowledge of these languages both within their countries and internationally;
- To access sources of information on HLT.

### 1.4.2 Professional skills

On graduation students should be able:

- To develop NLP resources and tools;
- To work in industrial, commercial, or public institutions to improve their KZ and UZ language resources and develop tools for their specific language needs;
- To use translation technology as human translators;
- To work with international companies and institutions to develop tools for integration in multilingual NLP projects;
- To work in research teams on information retrieval, text mining, data mining, sentiment analysis, opinion mining, question answering (QA), and machine translation;
- To develop speech technology for various human <> computer applications.

### 1.4.3 Career Opportunities

Since this Master's is the first of its kind in the CA countries, one can expect some of the students to continue to PhD level and become part of research projects in NLP and HLT for KZ and UZ. Others should be able to find employment in industrial, commercial, or public institutions that need to develop efficient language management tools and resources. The CA universities will promote the skills the students are expected to acquire by creating protocols and internships between the universities and these institutions.

## 2. Qualification Description 2 - for Computer Science faculties or departments

### 2.1 General introduction

This Masters' program is innovative and ambitious, and is the first initiative of its kind in the Uzbek and Kazakh universities.

It is ambitious because it aims to have a large positive impact on the Kazakh and Uzbek societies. By providing students with a good foundation in computational and linguistic resources, they can apply this knowledge to strengthen the Kazakh (KZ) and Uzbek (UZ) languages, creating tools and resources that will allow for better communication within

their countries, as well as multilingual tools that can foster international communication. It is innovative because it will involve cooperation in planning the course between international and national universities, cooperation between the teachers at these universities in the implementation of the course modules, and cooperation between students and teachers in the research projects that will be developed.

The primary objective of this course will be to train professionals who will be able to develop resources and tools, and these resources and tools will in turn be useful to the community of speakers of these languages. Graduates will be in a position to work on future university research projects, as well as projects involving human language technologies in public, industrial, and commercial institutions.

The teaching methodology is innovative. The emphasis will be on interdisciplinary cooperation that will be facilitated by blended learning methodologies, mixing traditional methods with virtual or online learning. These methods will encourage students to develop both their personal and autonomous learning skills as well as their ability to network successfully and work in teams.

The interdisciplinary focus will mean that the students with backgrounds in computer science will be encouraged to cooperate with students from the linguistic sciences. There will be some core modules for both groups, and students will be able to choose from a variety of elective modules. Besides, since the success of the Masters requires cooperation, every opportunity will be provided for the students to work together on interdisciplinary group projects.

## 2.2 Admission

Students applying for this Masters program should have a first degree in Computer Science or a similar area.

## 2.3 Objectives

- To train a group of future professionals in the areas of computational linguistics (CL), natural language processing (NLP), and human language technologies (HLT);
- To train these future professionals to work as teams on interdisciplinary projects;
- To develop the students' capacity for autonomous study through blended learning;
- To train a group of future professionals to develop, use, and improve:
  - Digital language resources in KZ and UZ: e.g. dictionaries, terminology databanks; Wordnets, and ontologies of more technical and scientific language; and corpora – written, spoken and multimedia;
  - Annotation tools for morphological and syntactic analysis of KZ and UZ;
  - Spelling checkers, grammar checkers, style checkers and predictive writing for use with word-processing programs and social media apps in KZ and UZ;

- To work with international companies and institutions to develop tools in KZ and UZ for integration in multilingual NLP projects;
- To work in research teams on machine translation;
- To work in research teams on information retrieval, data mining, sentiment analysis, opinion mining, question answering (QA), and other areas, with particular emphasis on promoting the KZ and UZ languages;
- To develop speech technology in the KZ and UZ languages for various human <> computer applications.

## 2.4 Learning Outcomes

### 2.4.1 General skills

On graduation students should be able:

- To study autonomously using blended learning
- To work in interdisciplinary teams;
- To understand the importance of studying natural languages;
- To develop KZ/UZ language resources and tools;
- To develop NLP resources and tools.

### 2.4.2 Professional skills

On graduation students should be able:

- To work in industrial, commercial, or public institutions to develop or improve their KZ and UZ language resources and tools;
- To work with international companies and institutions to develop tools for integration in multilingual NLP projects;
- To work in research teams on information retrieval, text mining, data mining, sentiment analysis, opinion mining, question answering (QA), and machine translation;
- To develop speech technology for various human <> computer applications.

### 2.4.3 Career Opportunities

Since this Master's is the first of its kind in the CA countries, one can expect some of the students to continue to PhD level and become part of research projects in NLP and HLT for KZ and UZ. Others should be able to find employment in industrial, commercial, or public institutions that need to develop efficient language management tools and resources. The CA universities will promote the skills the students are expected to acquire by creating protocols and internships between the universities and these institutions.

## 3. Qualification Description 3 – for Linguistics faculties or departments

### 3.1 General introduction

This Masters' program is innovative and ambitious, and is the first initiative of its kind in the Uzbek and Kazakh universities.

It is ambitious because it aims to have a large positive impact on the Kazakh and Uzbek societies. By providing students with a good foundation in computational and linguistic resources, they can apply this knowledge to strengthen the Kazakh (KZ) and Uzbek (UZ) languages, creating tools and resources that will allow for better communication within their countries, as well as multilingual tools that can foster international communication. It is innovative because it will involve cooperation in planning the course between international and national universities, cooperation between the teachers at these universities in the implementation of the course modules, and cooperation between students and teachers in the research projects that will be developed.

The primary objective of this course will be to train professionals who will be able to cooperate in the development of resources and tools, and these resources and tools will in turn be useful to the community of speakers of these languages. Graduates will be in a position to work on future university research projects, as well as projects involving human language technologies in public, industrial, and commercial institutions.

The teaching methodology is innovative. The emphasis will be on interdisciplinary cooperation that will be facilitated by blended learning methodologies, mixing traditional methods with virtual or online learning. These methods will encourage students to develop both their personal and autonomous learning skills as well as their ability to network successfully and work in teams

Students with a background in languages and linguistics will be encouraged to apply for this Masters and will be encouraged to work later with students in computer science studying a parallel Master's program. The course will share core modules, and students will be able to choose from a variety of elective modules. Since the success of the Masters requires cooperation, every opportunity will be provided for the students from both paths to work together on interdisciplinary group projects.

### 3.2 Admission

Students applying for this Masters program should have a first degree in Linguistics and Language.



### 3.3 Objectives

- To train a group of future professionals in the areas of computational linguistics (CL);
- To train these professionals to work in the future in teams on interdisciplinary projects with students from natural language processing (NLP), and human language technologies (HLT);
- To develop the students' capacity for autonomous study through blended learning;
- To train a group of future professionals to develop, use, and improve:
  - Digital language resources in KZ and UZ: e.g. dictionaries, terminology databanks, and written corpora;
  - Annotation tools for morphological and syntactic analysis of KZ and UZ;
  - Spelling checkers, grammar checkers, style checkers and predictive writing for use with word-processing programs and social media apps in KZ and UZ;
- To train future professional translators and interpreters in various forms of translation technology - CAT (computer assisted translation) tools, such as translation memories, terminology databanks, and machine translation.

### 3.4 Learning outcomes

#### 3.4.1 Generic skills

On graduation students should be able:

- To study autonomously using blended learning;
- To understand the importance of acquiring computer skills for developing language resources;
- To contribute to the development of KZ/UZ language resources, such as dictionaries, terminology databanks and corpora;
- To work in interdisciplinary teams;
- To use these resources to study the KZ/UZ languages and promote knowledge of these languages both within their countries and internationally.

#### 3.4.2 Professional skills

On graduation students should be able:

- To work in industrial, commercial, or public institutions to improve their language resources and develop tools for their specific language needs;
- To use translation technology as human translators;
- To create parallel and comparable corpora between KZ, UZ and other languages, especially English;
- To access sources of information on language technologies for users.

### 3.4.3 Career Opportunities

Since this Master's is the first of its kind in the CA countries, one can expect some of the students to continue to PhD level and become part of research projects in NLP and HLT for KZ and UZ. Others should be able to find employment in industrial, commercial, or public institutions that need to develop efficient language management tools and resources. The CA universities will promote the skills the students are expected to acquire by creating protocols and internships between the universities and these institutions.



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