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ФИО: Ястребов Олег Александрович
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**Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA
(RUDN University)**

Institute of World Economy and Business

(educational division (faculty/institute/academy) as higher education programme developer)

COURSE SYLLABUS

ARTIFICIAL INTELLIGENCE SYSTEMS IN PROFESSIONAL ACTIVITY

(course title)

Recommended by the Didactic Council for the Education Field of:

45.04.02 "LINGUISTICS" (Master's degree)

(field of studies / specialty code and title)

The course instruction is implemented within the professional education programme of higher education:

"Foreign language of professional communication and specialized translation"

(higher education programme profile/specialisation title)

1. COURSE GOAL

The goal of mastering the course "Artificial intelligence systems in professional activity" is to familiarize undergraduates with the fundamentals of data science and the principles of artificial intelligence (AI) in solving professional tasks, to develop knowledge about existing and promising models for the application and regulation of artificial intelligence.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline (module) " Artificial intelligence systems in professional activity " is aimed at the development of the following competencies /competences in part:

Table 2.1. List of competences that students acquire through the course study

Competence code	Competence description	Competence development indicators (in the framework of this course)
GC-3	Ability to organize and manage the work of the team, developing a team strategy to achieve the goal	GC-3.1 Demonstrates an understanding of the principles of teamwork
		GC-3.2 Ability to manage team members to achieve the set goal

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "Information and communication technologies in specialized translation" refers to the component of (B1.V.DV.02) block of the higher educational programme curriculum.

Within the higher education programme students also master other modules and / or internships that contribute to the achievement of the expected learning outcomes as results of the course "Information and communication technologies in specialized translation" study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence description	Previous Disciplines/Modules*	Subsequent Disciplines/Modules*
GC-3	Ability to organize and manage the work of the team, developing a team strategy to achieve the goal	-	Negotiations and presentations technologies

* - to be filled in according to the competency matrix of the higher education programme

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "Information and communication technologies in specialized translation" is 2 credits.

Table 4.1. Types of academic activities during the periods of higher education programme mastering (full-time training)*

Type of academic activities	TOTAL, academic hours.	Semesters/training modules			
		1	2	3	4
<i>Contact, academic hours</i>	34			17	
including:					
Lectures (LC)					
Laboratory work (LW)				17	
Practical/seminar classes (S)					
<i>Self-studies, academic hours</i>	38			38	
<i>Evaluation and assessment (exam/pass/fail grading), academic hours</i>					
Course workload	academic hours	72	72		
	credits	2	2		

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types*
1 semester (18h)		
Module 1. Introduction to Artificial Intelligence Systems	Topic 1.1. Artificial intelligence notion and history	S
	Topic 1.2. Artificial intelligence systems and its core features	S
	Topic 1.3. Classification and examples of systems. Its function	S
Module 2. Knowledge Representation Models in Artificial Intelligence Systems	Topic 2.1. Data and Knowledge. Knowledge Bases. Properties and Differences Between Knowledge and Data. Declarative and Procedural Forms of Knowledge Representation. Methods of Knowledge Representation. Logical Model of Knowledge Representation.	S
	Topic 2.2. Formal Logical Models. Types of Logical Models, General Terms and Definitions. Formal (Aristotelian) Logic: Names, Statements, Procedures for Proof and Refutation.	S
	Topic 2.3 Concept of predicate, formula, universal and existential quantifiers. Production model of knowledge representation.	S

Course module title	Course module contents (topics)	Academic activities types*
	Topic 2.4 Semantic networks. A brief history of development. Basic concepts of semantic networks: representation of objects and relationships between them in the form of a directed graph.	S
Module 3. Fundamentals of Machine Learning and Artificial Intelligence	Topic 3.1 History of development and application areas of machine learning.	S
	Topic 3.2 Basic machine learning and AI algorithms. Data processing for machine learning. Types and tasks of machine learning.	S
	Topic 3.3 Supervised and unsupervised machine learning. Machine learning problem settings: regression, classification, clustering, visualization.	S
	Topic 3.4 Model evaluation and selection in machine learning. Application of machine learning (TFL, translation, interpreting)	S
	Topic 3.5. Ethical and social issues in machine learning. Principles of search engine operation.	S
Module 4 Expert systems. Knowledge-based systems.	Topic 4.1 Expert systems as a research area in artificial intelligence. General characteristics of expert systems.	S
	Topic 4.2 Types of expert systems and types of problems they solve. Structure and operation of expert systems. Typical structure of an expert system.	S
	Topic 4.3 Classification of expert systems. Technology for developing an expert system. Tools for developing expert systems.	S
	Topic 7.2 Practical use of the TRADOS 5 Freelance system, the general principle of TranslationMemory	S
	Topic 7.3 Service programs, some auxiliary functions, other TranslationMemory systems	S

* - to be filled in only for full -time training: LC - lectures; LW - lab work; S - seminars.

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Classroom type	Classroom equipment	Specialized educational/laboratory equipment, software and materials for course study (if necessary)
Computer class	An auditorium for conducting classes, group and individual consultations, current and mid-	472

Classroom type	Classroom equipment	Specialized educational/laboratory equipment, software and materials for course study (if necessary)
	term assessment, equipped with personal computers (in the amount of ___ pcs), a board (screen) and technical means of multimedia presentations.	Laptop Asus X751L Intel I5 1700 MHz/8 GB/1000 GB/DVD/audio (15) Multimedia projector Benq MW526 Screen 220*220 MS Windows 8.1 64bit Microsoft Office 2013 SDL Trados Studio 2015 Adobe Reader FastStone Image Viewer
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment	324 Multimedia projector Casio XJ-M250 Wall-mounted screen Digis Dsob-1106

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main reading:

1. Bessmertny, I.A. Artificial Intelligence Systems: A Textbook for Universities / I.A. Bessmertny. — 3rd ed., revised and updated. — Moscow: Yurayt Publishing House, 2024. — 164 p. — (Higher Education). — ISBN 978-5-534-18416-7. — Text: electronic // Educational Platform Yurayt [website]. — URL: <https://urait.ru/bcode/5349632>.
2. Voronov, M.V. Artificial Intelligence Systems: Textbook and Practicum for Universities / M.V. Voronov, V.I. Pimenov, I.A. Nebaev. — 2nd ed., revised and updated. — Moscow: Yurayt Publishing House, 2024. — 268 p. — (Higher Education). — ISBN 978-5-534-17032-0. — Text: electronic // Educational Platform Yurayt [website]. — URL: <https://urait.ru/bcode/544161>.
3. Artificial Intelligence Systems / Ostroukh A.V., Surkova N.E. — Lan's Publishing House, 2024. — 228 p. — Access mode: <https://e.lanbook.com/book/379988>.

Additional reading:

1. Neujmin Ya.G. Modeli v nauke i texnike: Istoriya, teoriya, praktika. L.: Nauka. Romanov P.S., Romanova I.P. — Artificial Intelligence Systems. Modeling of Neural Networks in MATLAB. Laboratory Practicum: A Textbook for Universities. — Lan's Publishing House, 2023. — 140 p. — ISBN 978-5-507-46139-4. — Access mode: <https://e.lanbook.com/book/298529>.
2. Kudryavtsev V.B. Intelligent Systems: Textbook and Practicum for Universities / V.B. Kudryavtsev, E.E. Gasanov, A.S. Podkolzin. — 2nd ed., revised and updated. — Moscow: Yurayt Publishing House, 2024. — 165 p. — (Higher Education). — ISBN 978-5-534-07779-7. — Text: electronic // Educational Platform Yurayt [website]. — URL: <https://urait.ru/bcode/537945>.
3. Gasanov E.E. Intelligent Systems. Theory of Information Storage and Retrieval: A Textbook for Universities / E.E. Gasanov, V.B. Kudryavtsev. — 2nd ed., revised and updated. —

Moscow: Yurayt Publishing House, 2024. — 271 p. — (Higher Education). — ISBN 978-5-534-08684-3. — Text: electronic // Educational Platform Yurayt [website]. — URL: <https://urait.ru/bcode/537938>.

Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements

<http://lib.rudn.ru/MegaPro/Web> - RUDN Electronic Library System (RUDN ELS)
<http://lib.rudn.ru/MegaPro/Web>

<http://www.biblioclub.ru/> EL "University Library Online" <http://www.biblioclub.ru>

<http://www.biblio-online.ru> EL "Yurayt" <http://www.biblio-online.ru>

<http://www.studentlibrary.ru/> EL "Student Consultant" www.studentlibrary.ru

<http://e.lanbook.com/> EL "Lan" <http://e.lanbook.com/>

- EL "Trinity Bridge"

2. Databases and search engines:

<http://docs.cntd.ru/> electronic foundation of legal and normative-technical documentation <http://docs.cntd.ru/>

- Yandex search engine [https://www.yandex.ru /](https://www.yandex.ru/)

- Google search engine [https://www.google.ru /](https://www.google.ru/)

- SCOPUS abstract database [http://www.elsevierscience.ru/products/scopus /](http://www.elsevierscience.ru/products/scopus/)

*Training toolkit for self- studies to master the course *:*

1. Methodological Guidelines for preparation for classes in the course “Information and communication technologies in specialized translation”.

It is a collective discussion of theoretical issues by master's students under the guidance of the teacher. The main objectives of the practical training are:

- consolidation, deepening and expansion of students' knowledge of the course;
- development of the ability to set and solve intellectual problems and issues;
- improvement of the students' ability to prove their point of view, as well as to prove and refute other judgements;
- demonstration by students of the achieved level of theoretical training;
- development of skills of independent work with literature.

At seminars there are detailed discussions on the basis of the plan, oral questioning of students on the questions of the lesson, listening and discussion of reports (abstracts) of students, colloquium, solving linguistic problems, etc. The choice of the form of this lesson is determined by the specifics of the topic, the level of training of undergraduates, and is designed to provide the most complete disclosure of the content of the topic under discussion, to achieve the greatest activity of undergraduates. When realising the competence approach in the educational process active forms of conducting classes are used. When studying various topics of the discipline, role-playing and business games, debates, case studies, brainstorming are used.

Active learning methods used in teaching include:

- educational group discussions,

In a learning discussion, the solution to a problem is to be found in the learning process by a given group of people and in a given classroom. The goal is a search process that should lead to objectively known but subjectively, from the students' point of view, new knowledge.

When conducting a discussion, it is necessary that the student participants have a clear understanding of the subject matter, the general framework of the discussion and the order of the discussion. When organising a discussion, the teacher should create a favourable, psychologically comfortable environment. Seat the participants in a circle. In addition, it is important to clarify the topic, question beforehand. The introductory part is built in such a way as to update the participants' knowledge, introduce the necessary information, create interest in the problem.

There are several options for organising the introductory part of the discussion:

1. A brief preliminary discussion of the issue in small groups;
2. Introducing the topic of the conversation through the assignment of one or two participants to make an introductory problem statement that reveals the problem statement;
3. using a brief pre-talk on the topic.

Any of the options should not take too long to allow for a quicker transition to the discussion.

There are a number of sequential steps that must be taken to effectively conduct a discussion:

1. Allocate roles-functions in the discussion group (facilitator (organiser), analyst, recorder, observer).
2. Determine the order of work when discussing the problem in discussion groups (problem statement; grouping participants into groups, assigning roles in small groups, explaining to the leader what the expected participation of participants in the discussion is; discussing the problems in small groups; presenting the results of the discussion in front of the whole team; continuing the discussion and behaviour of the results).

- training (business and role-playing) games,

Among the active forms of student training, a special place belongs to the game (educational, business, didactic), which most adequately reflects the socio-psychological characteristics of young people as an object and subject of education and upbringing and training sessions.

Educational games help to form such important key qualifications of specialists as communicative abilities, tolerance, teamwork, independent thinking. Training games are built on the principle of imitating various situations of cognition and communication. Some fragments of the game can be used directly in the classroom: role-playing, for example, a student is offered the role of a "polemicist", asking the speaker difficult questions, or when the most prepared student is assigned to conduct a discussion of one of the issues presented in the practical training.

A business game requires following some sequential steps:

The first is to communicate the task to the participants. Each participant should have the printed text of the task (as for the game conditions, it should be agreed in advance whether they are the same as in real life when solving similar tasks, or whether any game changes are made).

The second is the creation of teams. Teams are formed in any way, and they have the right to give themselves some names or numbers.

The third is the direct work of the teams.

Then each team prepares a short (up to 10 minutes) oral report on their approaches and methods of solving the problem and on the solution itself. The report is composed in a free form. The choice of the report form is also a game result.

After hearing the reports, it is necessary to evaluate them, compare and summarise the results. This is an important part of the learning process.

When applying the role-playing method, the organisers should follow some recommended guidelines:

1. A role-play plan should be carefully developed, with literature for role development or dossiers of materials for the main roles. It is advisable to have at least two classrooms for groups to work in, as role development is a creative endeavour.
- 2 The effectiveness of role-playing is determined by the novelty of the experience, so if it is used every chance you get, the value of this interactive technology is diminished.

3) The number of working groups should be small (up to 10 people). Such a number allows to create an informal creative environment conducive to productive learning.

4. It is desirable to involve assistants in the role-playing game. They can be other faculty members or graduate students conducting research on the topic of the game.

5. If possible, make a video recording that will provide feedback and validation.

Academic training is a method of active learning aimed at the development of knowledge, skills, abilities and personal qualities. It is an intensive short-term (2 hours) form of training in a group (10-12 people), aimed at mastering theoretical material and its consolidation, as well as the development of professional skills.

* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (competences in part) upon the course study completion are specified in the Appendix to the course syllabus. <https://esystem.rudn.ru/course/view.php?id=640>

*The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

Ass. Professor FLD EF

Position, Educational Department

Sibul V.V.

Name and surname

Signature

HEAD OF THE HIGHER EDUCATION PROGRAMME:

FLD EF

Educational Department

Malyuga E.N.

Name and surname

Signature