PROFESSIONAL QUALIFICATION

The professional qualification of the graduates of the educational and qualification degree "Master" in the specialty "Artificial Intelligence in Biomedicine" is a specialist for research and development activity in the field of health care, medicine and artificial intelligence. The structure and content of the training provide the necessary theoretical knowledge and practical skills, forming professional competence for work in scientific-applied, administrative and management positions for organizations in the field of biomedicine and health care and related fields of activity, as well as for expert and consulting activities .

The Master's program was created by an interdisciplinary team that actually carries out interdisciplinary practices (educational, scientific, entrepreneurial) in a wide international partner network.
The curricula of the Master's program offer part of the compulsory courses, as well as a wide range of elective and optional disciplines, which students fulfill according to the various incoming professional competencies and can choose depending on their basic education and their individual interests. These disciplines offer the acquisition of highly specialized knowledge and skills in relation to the prospective professional development of graduates. Considering the incoming professional competence of the candidates for the Master's degree in "Artificial Intelligence in Biomedicine", the training is carried out in two curricula, according to the incoming professional qualification of the students:

- curriculum for the Master's degree program in "Artificial Intelligence in Biomedicine" after the "Bachelor" degree program in professional field 7.5 Health Care or a similar specialty in professional field 4.3 Biological Sciences; or "Master's" in the field of higher education 7. Health care and sports, professional fields from 7.1 to 7.5 including professional field 4.3 Biological sciences;

  curriculum for the educational and qualification degree "Master" in "Artificial Intelligence in Biomedicine" after educational and qualification degree "Bachelor" in professional field 4.6 Informatics and computer sciences or similar specialties in professional field 5.2 Electrical engineering, electronics and automation and professional field 5.3. Computer technology and technology; or educational and qualification degree "Master" in another field of higher education.

The training lasts three semesters and ends with a thesis defense (master's thesis).

TRAINING GOALS

The main goal of the training in the specialty "Artificial Intelligence in Biomedicine" with the educational and qualification degree "Master" is to meet the public needs for highly qualified specialists with professional competence in the application of artificial intelligence in biomedicine.

The structure and organization of the master's program in "Artificial Intelligence in Biomedicine" is directed to the needs of practice and the labor market, and the training is aimed at:

- acquisition of a wide range of specialized theoretical and practical knowledge in the field of medicine, health care and computer technologies, which scale up and develop what was learned in previous stages of training;
- acquiring the necessary knowledge, skills and practice to work in a complex, innovative and dynamically changing environment in the field of interdisciplinary research and development in medicine, healthcare and medical and social care.
- development of decision-making skills in the complex and dynamic environment in the field of health care and related fields of activity, abilities to absorb new cutting-edge knowledge and apply innovative methods and approaches in a changing situation;
- formation of an attitude to develop new skills in response to the emergence of new knowledge and practices;
- development of decision-making innovation capabilities, entrepreneurship in introducing artificial intelligence in organizations and institutions working in healthcare and related fields of activity;
- building skills for generating new knowledge related to conducting scientific research and their application in daily practice.

THEORETICAL AND PRACTICAL TRAINING

Preparation for the specialty "Artificial Intelligence in Biomedicine" in educational and qualification degree "Master's" is interdisciplinary and ensures the acquisition of a wide range of specialized theoretical knowledge, practical skills in the field of medical and computer sciences and the development of professional and personal competences necessary for the successful professional realization of the graduated students.

The training in the Master's program is aimed at two target subgroups, with the aim of bringing them together as quickly as possible and working together, they have separate specialized disciplines, as well as general disciplines already in the first semester of their studies.

Students with expertise in healthcare will acquire knowledge, skills and competencies in data processing, data engineering, coding and programming, computational practices and models, for data visualization and processing.

Students with expertise in computer science and information technologies will acquire knowledge, skills and competences about biological data, occurrences, processes, issues; an interdisciplinary approach to the study of the human body; a current view on the diagnosis of diseases and their possible treatments.

The common disciplines for the students of the two target subgroups are conducted and evaluated with problem-based and project-based approaches and with the application of modern training methods, in which the different needs for learning and teaching skills of lecturers and students are satisfied and a favorable collaborative learning environment. Training on the topics of artificial intelligence and ethical norms and practices is aligned with the available standards, reference frameworks and recommendations in national and international documents.

During their studies in the associated partners of the project and with the assistance of the partner organizations of the university, joint practices with a scientific-research and practical-applied orientation are planned and implemented, as a result of which the students will participate in forums, seminars, conferences and symposiums, where they will present their experience, achievements and ideas for innovative solutions.

The training includes up-to-date technologies and innovative materials, which are studied and used functionally throughout the entire course of study in the Master's program, not just in a specific discipline. Practical laboratory classes are foreseen in the curricular activities, as well as in outside curricular activities, in which other students, doctoral students, professors, guest scientists and partners can also participate.

Through elective and optional disciplines, inclusion in the curriculum, students are provided with the opportunity to choose disciplines related to arts, security and practices.

1. Field and scope of knowledge

The Master in "Artificial Intelligence in Biomedicine":

- possesses a wide range of specialized theoretical and practical knowledge in the field of human health, biological data, structures and processes underlying the diagnosis of diseases and the possibilities for prevention and treatment;
- has theoretical and practical knowledge of engineering, coding and programming, computational models for visualization and data processing.
- possesses knowledge and skills for independent conduct of scientific research and interpretation of results;

- knows, understands and interprets theories and concepts in the field of application of artificial intelligence in biomedicine;
- possesses highly specialized and cutting-edge theoretical and practical knowledge in the field of computer and medical sciences and demonstrates a critical awareness of the connections between them that form the interdisciplinary profile of training.

2. Practical and cognitive skills

Along with the teaching of theoretical knowledge, the training is aimed at developing skills, building on those learned in the previous stages of training. The Master in "Artificial Intelligence in Biomedicine":

- possesses a wide range of cognitive and practical skills necessary for understanding and expressing theories, principles and regularities in the field of human health and technology, as well as for solving tasks of a more abstract and creative nature, requiring an innovative approach;
- possesses analytical and prognostic skills and the ability to identify and analyze complex problem situations by integrating knowledge from new and interdisciplinary fields and, based on this, develops and implements new ideas and solutions;
- demonstrates free application of innovative methods and tools for managing biomedical data and identifying opportunities for their development and application for prevention, diagnosis and treatment of diseases;
- possesses leadership skills for the formation, development and management of networks and teams, including multidisciplinary ones, for solving complex tasks and unpredictable problems in the field of biomedicine.

3. Professional and key competencies

Training in the specialty "Artificial Intelligence in Biomedicine" with educational and qualification degree "Master" forms competences for learning, communication, social and professional competences, as well as an opportunity for students after completing the Master's degree to show independence and responsibility in the application of artificial intelligence to improve the processes of prevention, diagnosis and treatment of diseases. The graduate with Master's degree in "Artificial Intelligence in Biomedicine" possesses professional and key competencies for carrying out independent and team-based specialized activities in a real professional environment such as:

- initiation of projects and programs; design and participation in the implementation of various technological systems applied in the diagnosis and treatment of diseases;

- presentation of one's own concepts, problems and possible solutions to specialists in various fields, as well as to a non-specialist audience; argumentation of concepts regarding technologies and practices related to the development of medical activities;
- systematic assessment of own knowledge and identification of needs for new knowledge; mastering complex educational content by applying various methods and techniques, as well as own approaches to its mastery;
- conducting scientific research.

FUNCTIONS THAT SUCCESSFUL GRADUATE MASTERS CAN PERFORM

- **Research activities**

Graduates of the master's program can work as researchers and collaborators in research teams, laboratories, analytical teams in biotech companies, start-ups and others for the purposes of biomedicine and pharmacy.

- **Management activities**

Graduates of the Master's program can work as heads of research laboratories; to create and lead research and innovation projects in the field of biomedicine; establish and lead analytical teams in biotech companies, startups and for biomedical and pharmaceutical purposes; to be leaders in solving complex problems requiring the participation of international experts from various fields; to initiate and manage sustainable modern national and international policies to support the improvement of the quality of life.

- **Administrative and expert activities**

Graduates of the Master's program can work in the field of biomedicine and health care, and by expanding their competencies in data processing and analysis and the use of artificial intelligence, they will be able to perform functions and additional activities in the organization, processing, analysis and visualization of data.

OPPORTUNITIES FOR PROFESSIONAL REALIZATION

As a result of the acquired knowledge and skills, graduates of the "Artificial Intelligence in Biomedicine" major with the Master's degree can occupy expert and analytical positions in the country according to the positions announced by the national classifier (2022) such as: researchers within scientific, research and development groups ; chairmen and executive directors, respectively, of NGOs and organizations in biotechnology, health and medicine; to be heads of groups and units in research and development organizations; to be heads of research and development; social entrepreneur, as well as positions in the field of positions

related to ICT and software development, which are described in the qualification characteristic for the needs of the description of the Master's program in professional direction 4.6. Informatics and Computer Science.

Graduates of the Master's program can occupy expert and analytical positions also abroad in relation to the announced positions related to analytical and research, innovation and entrepreneurial focus and activities, since the candidates are Bulgarian and foreign citizens and the training is planned to be provided in English and in distance learning.

The acquisition of the Master's degree in "Artificial Intelligence in Biomedicine" enables the improvement of qualifications in the following areas:

- various forms of continuing education to increase qualifications and specializations, including under Ordinance No. 1 from 2015 for the acquisition of a specialty in the field of health care;
- training in the educational and scientific degree "PhD".

Note: The qualification characteristic was adopted by a decision of the Academic Council of Varna Free University "Chernorizets hrabar" in professional field 4.6 Informatics and computer sciences.