### **PROFESSIONAL QUALIFICATION**

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

The curriculum includes compulsory disciplines in the field of health care and information technology. In addition to the compulsory courses, the Master's program also provides a range of elective and optional subjects, from which students can choose depending on their basic education and their individual preferences for the development of professional competence. These disciplines offer the acquisition of highly specialized knowledge and skills in relation to the future professional development of graduates. Up-to-date technologies and innovative materials are included in the students' training, which are studied and used functionally throughout the course of study in the Master's program, not just in a specific discipline. Practical laboratory classes are foreseen within the framework of curricular activities, as well as within the outside curricular activities, in which other students, doctoral students, professors, guest scientists and partners can also benefit.

The specific combination of knowledge and skills, aligned with modern trends in the development of healthcare, electronic technologies and healthcare in general, enable graduates to be part of interdisciplinary teams at different levels of the healthcare system and the technology sector.

The Master's course in Artificial Intelligence in Healthcare is designed for professionals with a Bachelor's degree in professional areas 7.5 Healthcare and 4.6. Informatics and computer sciences and similar specialties in professional field 5.2 Electrical engineering, electronics and automation, professional field 5.3. Computer Engineering and Technology, or "Master's Degree" in the field of medicine, biological and life sciences, health, technical and computer sciences, or another field of higher education whose professional realization is related to biomedicine and health care. The training lasts three semesters and ends with a thesis defense (master's thesis).

## TRAINING GOALS

The main goal of the study in the specialty "Artificial Intelligence in Health Care" with the educational and qualification degree "Master" is to meet the specific needs of health care and social services by highly qualified professionals with training oriented towards modernization and technological revolution through the application of artificial intelligence in health care. The training in the specialty is interdisciplinary and ensures the acquisition of the necessary theoretical knowledge, practical skills and professional competences for work in the complex, dynamic and constantly changing environment of the information sector and healthcare as a whole.

The training in the Master's program in "Artificial Intelligence in Healthcare" is oriented to the needs of practice and the labor market, and is aimed at:

• acquisition of a wide range of specialized theoretical and practical knowledge in the field of 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 health care and medico-social care.

• development of decision-making skills in the complex and dynamic environment in the technological sphere of healthcare and related industries, 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;

• implementation of the disciplines through problem-based and project-based approaches and with the application of modern teaching methods, in which the different needs for learning and teaching skills of lecturers and students are met and a favorable environment for joint learning is provided;

• planning and implementation together with the associated project partners and with the assistance of the university's partner organizations of practices with a scientific-research and practical-applied orientation, as a result of which the students will participate in forums, seminars, conferences and symposia, at which they will present their experience, achievements and ideas for innovative solutions

• inclusion in the students' education of a modern technologies and innovative materials, which are studied and used functionally within the entire course of study in the Master's program, and not only in a specific discipline. Practical laboratory classes are provided within the framework of curricular activities, as well as within the framework of outside curricular activities, in which other students, doctoral students, professors, visiting scientists and partners can also participate.

# THEORETICAL AND PRACTICAL TRAINING

Preparation for the specialty "Artificial Intelligence in Health Care" in educational and qualification "Master" is aimed at acquiring a wide range of specialized theoretical knowledge in the field of practical skills in the field of health and computer sciences and development of professional and personal competences necessary for the successful professional realization of the graduates.

## 1. Field and scope of knowledge

The Master in "Artificial Intelligence in Healthcare":

• possesses a wide range of specialized theoretical and practical knowledge in the field of preventive care, health promotion, preventive nutrition, epidemiology, e-health, ergonomics, disabilities and technologies, social entrepreneurship and project management in healthcare;

• is familiar with the regulations, ethical norms and professional standards in the health care and medical-social services sector;

• possesses knowledge and skills for independent conduct of scientific research and interpretation of results, including working with databases and information systems;

• knows, understands and interprets theories and concepts in the field of extraction, processing, engineering of data and biomedical images and biometric security;

• possess highly specialized and cutting-edge theoretical and practical knowledge in the field of health and social care and demonstrate a critical awareness of the links between health and computer science that form the interdisciplinary profile of the study.

## 2. Cognitive and practical 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 Healthcare":

• possesses a wide range of cognitive and practical skills necessary for understanding and expressing theories, principles and regularities in the field of disease prevention, health

promotion, health care and computer technologies, as well as for solving tasks with a more abstract and creative nature requiring an innovative approach;

• possesses analytical and prognostic skills and the ability to identify, define and critically evaluate complex problem situations by integrating knowledge from new and interdisciplinary fields and on this basis develops and implements new ideas and solutions;

• demonstrates free application of innovative methods and tools for electronic health care and identification of opportunities for their development;

• possesses leadership skills for forming, developing and leading networks and teams, including interdisciplinary ones, to solve complex tasks and unpredictable problems in the field of health care technologies in hospital and outpatient medical facilities;

• demonstrates entrepreneurial skills for initiating and developing new technologies, generating new ideas and introducing innovations;

• demonstrates the ability to generate new knowledge and procedural skills related to conducting scientific research, interpreting the results and using them to implement technological solutions;

• develops skills for the use of information systems, databases and specific applications related to the health care sector and the work of medical institutions;

• demonstrates initiative to learn new knowledge and skills in new areas, necessary to work in a complex and unpredictable environment and the dynamically changing situation in healthcare.

## 3. Professional and key competencies

Training in the specialty "Artificial Intelligence in Healthcare" with educational and qualification "Master's" degree 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 in health care and the improvement of health, medical and social care. The Master's degree in "Artificial Intelligence in Healthcare" 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 in healthcare;

• initiating changes in electronic technologies in the complex conditions of the healthcare system, taking into account the complex influence of many diverse factors and their complex interaction;

• 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 health care, medico-social care and the organization of activities in medical facilities, as well as substantiation of ideas and proposals for their improvement;

• systematic assessment of own knowledge and identification of needs for new knowledge; mastering complex learning content by applying various methods and techniques, as well as own approaches to mastering it;

• conducting scientific research related to problems in the development of the health and social sector, health care, etc.

## FUNCTIONS THAT SUCCESSFUL GRADUATE MASTERS CAN PERFORM

### • Research activities

Graduates of the master's program can work as researchers and collaborators in scientific research teams, laboratories, analytical teams in biotech companies, startups, etc. for health care purposes.

### • 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 healthcare technology; establish and lead analytics teams in biotech companies, startups, and healthcare; 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 healthcare and, expanding their competences in data processing and analysis and the use of artificial intelligence, 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 Healthcare" major with a Master's degree can perform scientific-applied, administrative and management functions in organizations and institutions working in the sector of human health care and related spheres of activity. Graduates of the Master's program 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 abroad in relation to the announced positions related to analytical and research, innovation and entrepreneurial focus and activities, i.e. the candidates are Bulgarian and foreign citizens and the training is planned to be provided in English and in a distance form of training.

The acquisition of the Master's degree in "Artificial Intelligence in Health Care" allows you to increase your 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.