QUALIFICATION DESCRIPTION

This qualification defines the knowledge, skills, personal and professional competences of the Ph.D. students who have studied and graduated from the Ph.D. programme Mathematical Logic and Its Applications.

I. ANNOTATION OF THE PROGRAMME

The Ph.D. programme prepares highly qualified specialists in the field of Computability Theory, Degree Theory of Intractability, Effective Model Theory, Modal Logics, Algorithmic Problems in Computational Linguistics, Computability and Complexity in Analysis and a number of their applications mainly for the needs of teaching in universities and research units in the country and abroad. Its training provides scientific competence to PhD students who master modern research methods, as well as adequate knowledge of the latest developments in the field of Mathematical Logic, many of their applications and in particular the topic of the dissertation under development. Ph.D. students develop skills in planning and conducting scientific research and analyzing the results. The curriculum conforms to the European Qualifications Framework, which gives full comparability of qualifications with those in different countries and from different EU training systems. The training is carried out by the teaching staff of the Department of Mathematical Logic and its Applications in close collaboration with all colleagues of the FMI and in cooperation with other research organisations in the country and in the EU. Ph.D. students participate in the scientific and academic activities of the FMI, receiving real feedback on their achievements during the annual national and international scientific forums.

The admission and training of doctoral students is in accordance with the legal requirements of:
- Higher Education Act;
- Act for the Development of the Academic Staff in the Republic of Bulgaria;
- Regulations on the implementation of the Development of Academic Staff in the Republic of Bulgaria Act;
- The Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions in Sofia University “St. Kliment Ohridski”.

The training is of the following duration:
- 3 years of full-time study;
- 4 years in part-time form of study;
- up to 5 years of self-study.

The Ph.D. programme Mathematical Logic and Its Applications provides an opportunity to acquire the educational and scientific degree "Doctor of Philosophy" in professional field 4.5 Mathematics after:
- successful completion of all phases of the doctoral student's individual plan;
- successful defence of the thesis.

The training may be carried out in Bulgarian or in English, according to the candidate's preferences.The language of training is determined at the time of admission of the candidate and is not subject of change.

The main aims and objectives of the Ph.D. programme in Mathematical Logic and Its Applications are:
- to provide Ph.D. students with training (in Bulgarian or in a foreign language) aimed at acquiring, broadening and deepening their theoretical knowledge, researching cutting-edge problems, tracking the newest trends in the development of the scientific field;
- to impose high standards for conducting scientific research in the professional field and in particular in the scientific topics of the Ph.D. programme, using modern methods, tools and techniques for research;
- provide opportunities for doctoral students to produce independent and collaborative publications;
- to provide opportunities for Ph.D. students to participate in multidisciplinary teams of scientific and applied research projects carried out by members of the Department, under national and international programmes;
- to ensure that the Ph.D. student is consulted during the development of the dissertation by the supervisor, members of the department and the FMI;
- to provide opportunities for mobility of PhD students through the development of scientific cooperation with other higher education institutions and scientific organizations in the country and abroad;
- to provide opportunities for the acquisition of skills and experience for teaching within the disciplines offered by the Department;
- to train highly qualified personnel with in-depth fundamental and professional competence for scientific, research, practical-applied, expert and teaching activities in the field of Computability Theory, Intractability Degree Theory, Effective Model Theory, Modal Logics, Algorithmic Problems in Computational Linguistics, Computability and Complexity in Analysis and their applications, carried out both independently and in a team, by creating skills for planning and organizing scientific and applied research and for presenting the results obtained.

The training in the Ph.D. programme Mathematical Logic and Its Applications is in full compliance with the mission and the vision of the FMI and in line with the Scientific Development Strategy of the SU. In particular the training is in compliance with the goals set by the FMI-SU:
- to preserve and develop the scientific capacity in the field of fundamental research in mathematics and informatics;
- to transform this capacity into a basis for applications in other areas of mathematics, computer science and natural and social sciences whose modern development relies on the increasing use of algebraic and arithmetical methods;
- to preserve and develop long-standing traditions in the discovery and development of young talents in mathematics and computer science in order to build the next generation of teachers and researchers.

II. EXPECTED RESULTS AND COMPETENCES

As a result of the successful passing the full course of study offered in the Ph.D. programme Mathematical Logic and Its Applications, the Ph.D. students are expected to acquire the following knowledge, skills and competences:
- knowledge of the current state of the scientific field, the contemporal problems and development trends in the field and in its applications;
- highly specialized knowledge on problems specific for the field of the dissertation;
- skills for independent study and knowledge acquisition, as well as ability to generate new ideas in solving educational, research and practical problems, including in interdisciplinary areas;
- skills for planning and accomplishment of scientific and applied tasks in a timely manner;
- skills in clearly formulating problems, proposing solutions, expressing, justifying and defending scientific theses and ideas, and choosing appropriate approaches and methods;
- skills to carry out comprehensive scientific research;
- skills to write scientific publications in accordance with the criteria of international scientific journals, both in Bulgarian and foreign languages, as well as to present their results in scientific communications at national and international scientific forums;
- analytical, critical and systematic thinking skills;
- competences for effective use of bibliographic information, operation with specialised sources of information, use of specialised mathematical software tools;
- competences to teach courses conducted by the Department of Mathematical Logic and Its Applications;
- personal competences to work in research teams and manage research projects.

III. REALISATION

Graduates of the Ph.D. programme Mathematical Logic and Its Applications are highly prepared specialists who can be realised as:
- lecturers in universities, higher schools, schools for extracurricular work with students with outstanding interests in mathematics;
- researchers in scientific institutes, organizations and laboratories;
- leaders or team members working on national or international research or applied science projects;
- consultants or participants in the development of products and programmes of an educational nature, including for the needs of government and public bodies;
- evaluators of projects in the field of mathematical logic and its applications in other areas of mathematics, in the natural sciences and in areas of mathematical informatics such as coding theory, archiving, data storage and protection, information transmission and dissemination.

Graduates of the Ph.D. programme can:
- participate in various forms of continuing education (postdoctoral programmes);
- participate in competitions for academic positions and/or other degrees.