

**BULGARIAN ACADEMY OF SCIENCES
INSTITUTE OF MATHEMATICS AND INFORMATICS**

Approved:

(Acad. V. Drensky, Director of IMI-BAS)

QUALIFICATION PROFILE

Higher Education Area:

4. Natural Sciences, Mathematics, and Informatics

Professional Field:

4.5. Mathematics

PhD Programme:

Differential Equations

The PhD programme in Differential Equations provides the third degree of higher education for acquiring the educational and scientific degree of Doctor of Philosophy.

This Qualification Profile determines the knowledge, skills, personal and professional competences of PhD students who have pursued and completed the PhD programme in Differential Equations.

Requirements for admission and training

The admission and training of PhD students are in accordance with the legal requirements of:

- the Act on Higher Education;
- the Act on Development of the Academic Staff in the Republic of Bulgaria;
- the Regulations on the Implementation of the Act on Development of the Academic Staff in the Republic of Bulgaria;
- the Regulations on the Conditions and Order for Acquiring Scientific Degrees and Occupying Academic Positions at the Bulgarian Academy of Sciences;
- the Regulations on the Conditions and Order for Acquiring Scientific Degrees and Occupying Academic Positions at the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences;
- the Rules for the Activity of the Training Centre (TC) and the Academic Council (AC) of BAS.

The duration of the programme is:

- 3 years in case of full-time training;
- 4 years in case of part-time training;
- up to 3 years in case of self-study.

The PhD programme in Differential equations provides the opportunity to obtain the educational and scientific degree of Doctor of Philosophy in professional field 4.5. Mathematics upon:

- successful completion of all stages of the PhD student's individual plan;
- successful defence of the thesis.

Aim

The PhD programme in Differential Equations aims to train highly qualified specialists with in-depth fundamental and professional competence for individual and team work in research and applied activities as well as teaching in the field of differential equations and their applications, by creating skills for planning, organising and performing scientific and applied research and presenting its results.

The training in the PhD programme in Differential Equations is in full compliance with the mission and objectives of IMI-BAS, set out in the Research Development Strategy of the Institute of Mathematics and Informatics, and in particular with its priority area Differential Equations: partial differential equations, local solvability, hypoellipticity, origin and propagation of singularities, viscous solutions, nonlinear and degenerate elliptic and parabolic equations, Hamiltonian systems, Lie algebras and algebro-geometric methods in integrable systems, impulse and functional differential equations, cellular neural networks, applications of PDEs in mechanics, etc.

Competences

Holders of the educational and scientific degree of Doctor of Philosophy, awarded by IMI-BAS, shall have acquired intellectual qualities, knowledge, practical skills and habits for:

- independent study;
- teamwork;
- planning and carrying out scientific and practical tasks in time;
- setting problems, proposing solutions, justifying choices of approaches and methods;
- formulating, expressing, and defending scholar arguments, ideas, and concepts;
- conducting comprehensive scientific studies;
- presenting scientific results orally and in writing;
- doing all of the above fluently in English.

More particularly, the successful PhD graduates in Differential Equations at IMI-BAS shall:

- have acquired a wide professional horizon in theoretical and applied aspects in the field of Differential equations;
- have mastered the methods for creating and applying modern and original approaches in theoretical and applied aspects in the field;
- be skilled in use of modern information and communication technologies to facilitate research work;
- have acquired interdisciplinary training and knowledge to provide them with professional adaptation to the studied applied field;
- have knowledge and skills for solving complex problems of scientific and applied nature.

Careers

PhD Graduates in Differential Equations are highly qualified specialists, who can work as:

- lecturers in universities, colleges, etc.;
- researchers in scientific institutes and laboratories;
- leaders or members of teams working on national or international projects in fundamental or applied sciences;
- evaluators of projects in the field of differential equations and their applications;
- experts in governmental and public structures on issues related to applications of differential equations in other sciences, medicine, industry, etc.;
- consultants on issues of applications of differential equations in other sciences, medicine, industry, etc.

A PhD graduate can:

- participate in various forms of continuing qualification (postdoctoral programmes);
- apply for academic positions and obtain scientific degrees.

The Qualification Profile was approved by the Scientific Council of IMI-BAS on (Minutes No.).