

Programme Abstract

Doctoral Programme
“**Mathematical Modelling and Application of Mathematics**”
at the Institute of Mechanics, Bulgarian Academy of Sciences

Programme Objective:

The Doctoral programme “*Mathematical Modelling and Application of Mathematics*” at the Institute of Mechanics (IMech), Bulgarian Academy of Sciences, aims to educate and train highly qualified young researchers in the field of mathematical modelling of mechanical, physical, and engineering processes. The programme focuses on the development of advanced theoretical knowledge and practical skills for the formulation, analysis, and numerical solution of complex models describing real-world processes in mechanics, energy systems, materials science, and related fields.

Key Focus Areas:

- Development, analysis, and validation of mathematical models for the description and prediction of processes and phenomena in solid mechanics, fluid mechanics, heat and mass transfer, wave propagation, and dynamic systems.
- Application of modern analytical, numerical, and computational methods, including the finite element method, finite difference method, spectral methods, optimization techniques, and sensitivity analysis.
- Use of specialized scientific software and programming languages for numerical simulations, data processing, and interpretation of results.
- Application of mathematical modelling to the solution of real engineering and applied problems, including those related to energy systems, structures, engineering materials, as well as natural materials and environments.
- Promotion of interdisciplinary research and collaboration with other scientific fields within the Bulgarian Academy of Sciences, as well as with external academic and industrial partners.

Forms of Study:

Full-time (up to 3 years), Part-time (up to 4 years), Self-study (up to 5 years), as well as PhD by project (full-time, part-time, or self-study).