

Division: *Institute of Natural Sciences and Mathematics, Department of Mathematical and Computer Modelling*

Academic programme: *02.03.01 Mathematics and Computer Science, Computer Modelling in Engineering and Technological Design*

Programme length: *4 years*

Programme level: *Bachelor's degree*

Programme description: *Graduates are prepared to solve the following professional tasks:*

- *mathematical modelling of processes and objects based on standard packages of computer-aided design and research;*
- *debugging of science-intensive software;*
- *study of scientific and technical information, domestic and foreign experience on the subject of research;*
- *preparation of initial data for the selection and justification of scientific, technical and organizational solutions based on economic analysis;*
- *conducting experiments according to a given methodology, compiling a description of the research being carried out and analyzing the results; drawing up a report on the completed task, participation in the implementation of research and development results.*

Graduates can work as:

- *specialists, leading specialists, leading engineers, software engineers in management organization;*
- *developers of mathematical and computer models, mathematician-programmers in design organizations;*
- *researchers, leading engineers or mathematician-programmers in research organizations;*
- *mathematical engineers, mathematician-programmers, developers of mathematical and computer models or computer scientists in organizational and technological organizations;*
- *mathematician-programmers and computer scientists in production and management organizations;*
- *system programmers, system administrators of computer networks.*

Advantages:

- *strong training in higher specialized mathematics for future software engineers;*

- *teachers-practitioners, i.e., personnel who not only teach, but are also employees of organizations whose activities are related to the major "Computer Modelling in Engineering and Process Design" of the educational programme 02.03.01 Mathematics and Computer Science. Therefore, during the classes, the emphasis is on the practical application of the knowledge gained. Students and teachers of the department constantly use technological innovations to achieve a new quality of the educational process.*

Main programme-specific classes:

- *Introduction to Modern Science and Engineering Computing Packages*
- *Visual Programming*
- *Simulation*
- *Optimization Theory*
- *Theory and Methods of Experiment Planning*
- *Technologies and Models of Project Management in Information (Software) Systems*
- *Computational Mathematics*
- *Discrete Optimization*
- *Office Applications and Technologies*
- *Programming for Mobile Devices*
- *Programming in Java Language*
- *CAD for Technological Processes*
- *Modern Software Development Technologies*
- *Functional and Logic Programming*
- *Web Programming*
- *Mathematics in Modern Natural Science*
- *Mathematical Modelling of Physical and Technical Processes*
- *Fundamentals of Computer Modelling*
- *Introduction to Computer Analysis and Data Interpretation*
- *Analyzing and Processing of Large Datasets*
- *Practical Course on the Fundamentals of Computer Modelling*
- *Practical Course on Interactive Graphic Systems*
- *Requirements Analysis and Software Design*
- *Fundamentals of Human-Machine Interface Design*
- *Artificial Intelligence and Neural Networks*
- *Neuromathematics*
- *Parallel and Distributed Computing*
- *High Performance Computing on Graphics Accelerators*
- *Application of the ANSYS System to Solve Engineering Problems*
- *Application of the ANSYS System to Physical Processes Simulation*
- *Computational Geometry in Engineering Design*

- *Methods and Means of Scientific Visualization*

Programme manager: *Sofia A. Zagrebina, Doctor of Sciences (Physics and Mathematics), Professor, Head of the Department of Mathematical and Computer Modelling*