Educational program

PhD program "Informatics"

First year (1-2 semester)

1. **Language Preparation Course**

2. **Computer Skills Course – Choice of** IT Courses
   - LaTeX Basics
   - Data Analysis with R
   - Presentation skills
   - Photoshop
   - GIMP
   - MATLAB
   - Statistical data analysis
   - MS Excel
   - Transfer of scientific knowledge to the public through the free electronic encyclopedia Wikipedia

3. **Individual Research Plan 1**

   - Formulation of a research topic
   - Literature review and methodological preparation
   - Initial results and analyses

4. **Specialised courses – selection of at least 2 courses from Specialised courses at the PhD Training Centre of the Bulgarian Academy of Sciences**

   - CLOUD TECHNOLOGIES
   - PARALLEL PROGRAMMING
   - INTRODUCTION TO DATA KNOWLEDGE DISCOVERY
   - FUNDAMENTALS OF THE BRAIN-COMPUTER INTERFACE
   - DISTRIBUTED COMPUTATIONS
   - DESIGNING INTERNET APPLICATIONS
   - ADVANCED SENSORY INFORMATION PROCESSING
   - INTERNET TECHNOLOGIES FOR SYSTEM MANAGEMENT

- INTRODUCTION TO PARALLEL COMPUTING
- OPTIMIZATION METHODS
- MATHEMATICAL FOUNDATIONS OF NEUROBIOLOGY
- REINFORCEMENT LEARNING
- NEURAL IMPLANTS, NON-INVASIVE BCI's AND NEUROINFORMATICS
- INTUITIONISTIC FUZZY SETS
- SUMMARY NETWORKS

5. **Seminar on Information Technology Application 1**
    - Presentation and discussion of current research and projects
    - Critical analysis of scientific articles and reports
6. **General basic preparation according to the synopsis for an exam in a basic specialized subject**
    - Preparation of a synopsis on the topic of the dissertation
    - Synopsis exam: 2 written questions and 2 - 4 oral questions

Second year (3-4 semester)

7. **Individual Research Plan 2**
    1. Research and experiments
    2. Analysis and interpretation of results
    3. Preparation of a dissertation
8. **Ethics and professional development**
    - Scientific ethics and integrity
    - Publication of scientific papers
    - Participation in conferences and seminars
    - Career development and academic opportunities
9. **Seminar on Information Technology Application 2I**
    - Presentation and discussion of individual research projects
    - Interdisciplinary discussions and collaboration

Third year (5-6 semester) (for PhD students, part-time and self-study until the end of the doctoral period)

10. Individual Research Plan 3

- Finalising research and experiments
- Analysis and interpretation of results
- Preparation of a dissertation

11. Publications and presentations

1. Preparation of scientific articles for publication
2. Presentation of the results of international conferences

12. Presentation of the work done on the dissertation

- Presentation of published results
- Further specification of the topic of the dissertation (no later than 3 months before the date of the meeting of the section for the preliminary discussion)

13. Defense of the dissertation (up to 5 years after the expiration of **the doctoral degree)**

- Preparation and presentation of the dissertation to a scientific jury.
- Answers to questions and criticism from committee members

This program equips PhD students with the necessary knowledge and skills to conduct independent research in the fields of Informatics and Computer Science, and to apply it successfully in various scientific and practical contexts.