Kharkiv National University of Radio Electronics

Department of Computer Intelligent Technologies and Systems

**Syllabus**

FUNDAMENTALS OF EVOLUTIONARY CALCULATIONS

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| № | Field name | Detailed content, comments |

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| 1. | Name of the faculty | Computer engineering and management |
| 2. | Level of higher education | Master's degree |
| 3. | Code and name of the specialty | 123 Computer Engineering |
| 4. | Type and name of educational program | OPP "Computer Intelligent Technologies" |
| 5. | Code and name of the discipline | Fundamentals of evolutionary computing |
| 6. | Number of ECTS credits | 4 |
| 7. | Discipline structure (distribution by types and hours of study) | 24 years. - 12 lux,16 years. - 4 lbs,10 years. - 5 cons.,70. - independent work, type of control: exam |
| 8. | The schedule of studying the discipline | 1st year, 1st semester |
| 9. | Prerequisites for studying the discipline | Previous disciplines should be studied: "Higher Mathematics", "Information Theory and Coding", "Computer Architecture", "Neural computing structures" and "Data mining". |
| 10. | Discipline abstract | The discipline of basic (professional) training in the specialty contains content modules:1. Evolutionary algorithms: principles, definitions, models, methods.
2. Solving the main problems of multicriteria optimization using EC models and methods.
3. Methods, tools and information technologies of multidimensional optimization.
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| 11. | Competences, knowledge, skills, understanding, which are acquired by the applicant in higher education in the learning process | Ability to use the methods of the theory of evolutionary computations in solving engineering problems associated with the rapid processing of various information; it is reasonable to choose evolutionary algorithms for solving problems; programmatically implement optimization methods; to model the behavior of multi-agent systems using application simulation packages |
| 12. | Learning outcomes of higher education | Ability to use models and methods of systems analysis and mathematical statistics in the intellectual analysis of multidimensional data (classification, regression, clustering, etc.); perform basic operations of evolutionary data analysis; select and use multi-agent data analysis technologies; use Evolving Data Processing methods and tools; determine the possibility of using neural networks and evolutionary algorithms for multicriteria optimization |
| 13. | Assessment system according to each task for passing the test / exam | 1. Work out and defend laboratory work.2. Perform 2 tests. 4. Get at least 60 points per semester.5. Pass the combined exam.Semester grade () is calculated as the sum of grades for different types of classes and control measures. Each laboratory work is estimated at 5 points (1 point for attendance + 1 point for practice + 3 points for defense (delivery with an assessment)). DKR1 is estimated at 21-35 points, DKR2 - at 12-20 points, Test - at 12-20 points. The maximum rating during the semester is 100 points.Exam score  = (60-100) points. |
| 14. | The quality of the educational process | Adherence to the principles of academic integrity (<http://lib.nure.ua/plagiat>). Update of the work program of the discipline - 2020 |
| 15. | Methodical support | Complex educational and methodological support of the discipline "Fundamentals of evolutionary computing»For students majoring in 123« Computer Engineering »on the educational program« Computer Intelligent Technologies », branches of knowledge 12« Information Technologies »[Electronic resource] / Разр .: О.О. Bezsonov - Kharkiv: KNURE, 2019.<http://catalogue.nure.ua/knmz>. |
| 16. | Syllabus developer | O.O. Bezsonov, prof. Department of KITS, D. of Sci., Professor |