### **DATA STRUCTURES AND ALGORITHMS**

|  |  |
| --- | --- |
| **Тип дисципліни** | Elective |
| **Рівень вищої освіти** | First (Bachelor) |
| **Мова викладання** | English |
| **Кількість кредитів ЄКТС** | 8,0 |
| **Форми здобуття освіти** | Full-time |

**Результати навчання.** A student who has successfully completed the discipline must: be able to apply knowledge of the basics of algorithmization and the basic principles of building structures to store data for identification, formulation and solution of applied problems, using known methods of building algorithms and data processing algorithms; implement abstract data types, data with a dynamic structure, algorithms for working with trees, graphs, internal and external sorting, search, memory management; to combine the theory and practice of building structures for data storage and data processing algorithms, as well as to make optimal decisions when developing a strategy for solving applied problems; perform experimental research in order to find the optimal ways to solve applied problems, assess the complexity of algorithms, compare them and choose the best; develop algorithmic and application software using modern methods and programming languages.

**Зміст навчальної дисципліни.** Basic concepts of data structures. Basic array sorting algorithms. Search methods. Hashing. Recursive algorithms. Trees. Ways to present and walk around trees. Counts. Methods of graph representation. Organization of path search in the column. Lists. The main types of lists. Stacks. Queues. General approaches to solving olympic tasks.

**Запланована навчальна діяльність**: number of classroom hours - not less than 1/3 of the total number of hours planned for the study of the discipline.

**Методи навчання:** lectures (using methods of problem-based learning and visualization); laboratory and practical classes (using trainings, master classes, workshops), independent work (individual tasks).

**Форми оцінювання результатів навчання**: oral examination, defense of laboratory and practical work, test control.

**Форма семестрового контролю:** credit.

**Навчальні ресурси:**

1. Modular learning environment MOODLE. Access to the resource: <https://msn.khmnu.edu.ua>
2. Electronic library of the university. Access to the resource: <http://lib.khmnu.edu.ua/asp/php_f/p1age_lib.php>

**Викладач**: PhD O. Melnychenko