ABSTRACT

Master's thesis: 84 p., 7 figures, 23 tables, 29 sources, 1 applications.

Relevance: Online education is relevant today. Unfortunately, there are few alternative resources in Ukraine where online help can be obtained from various subject areas. More and more students from schools and universities, people who are retraining or just looking to develop are looking for ways to gain new theoretical knowledge and practical skills online. It is extremely difficult to master a large flow of information on your own, whatever the subject area is not learned by students, and therefore requires the help of professionals. Therefore, scheduling functionality is of great value. To solve the problem of how to implement this part of the functionality, a new mathematical problem will be posed and solved, which will give the opportunity and the basis for solving such problems.

Connection of the thesis with scientific programs, plans, topics. The thesis was written at the branch of The Department of Computer-aided management and data processing systems of the National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» at the V. M. Glushkov Institute of Cybernetics of the National Academy of Sciences of Ukraine under the topic VF.180.11 «To develop a mathematical apparatus focused on the creation of intelligent information technologies for solving combinatorial optimization and information security problems» (2017-2021 biennium), which is executed by the Resolution of the Bureau of Informatics of the National Academy of Sciences of Ukraine from 23.06.2016 p. № 2.

The purpose of the study is improving the quality of informing potential consumers and intellectualizing the processes of providing educational services online, by developing original software and algorithmic software and implementing it in the form of a specialized software system..

To achieve this goal, you must complete the following tasks:
- review the existing formulations of educational tasks;
- review existing methods for scheduling tasks;
- carry out comparative analysis of different methods and models and classify them;
- formalize the timetable for mentors and students;

– develop a local search algorithm and an ant algorithm;

– carry out the analysis of experimental studies;

– develop software to provide educational services;

– develop a startup project.

The object of study is a process for scheduling mentors and students that meets certain criteria.

The subject of study is methods and models of combinatorial optimization problems in scheduling theory problems.

The scientific novelty of the results is the formulation and analysis of a new task, as well as the study of methods for solving this problem, the development of methods of local search and ant algorithm for the task of scheduling online classes.

Publications. Work materials have been published in the international scientific journals «INNOVATIVE SOLUTIONS IN MODERN SCIENCE» (№6 (33), 2019) and «POLISH JOURNAL OF SCIENCE» (№16, 2019), as well as in theses of international scientific and practical conferences «Mathematical and systems simulation» (MODS 2019), «Information systems and control technologies» (ISTU-2019).

ONLINE EDUCATION, SCHEDULE THEORY, NP-COMPLICITY, COMBINATORY OPTIMIZATION, ACO, LOCAL SEARCH, MENTOR, STUDENT