ABSTRACT

Explanatory note size – 114 pages, contains 14 figures, 29 tables, 3 appendices, 21 references.

Topicality. The thesis addresses the problem of planning an individual student's study load in the presence of a large number of tasks with different deadlines, durations and limited available time. It is shown that widely used tools (calendars, to-do lists, task trackers, LMS) mostly just record deadlines and send reminders, but do not provide automated construction of a balanced schedule that takes into account the daily workload limit, the risk of missing deadlines and the uneven distribution of work throughout the semester. This reveals the need for a method and software system that generates an individual schedule of a student's study tasks as the solution of a resource-constrained optimisation problem.

Aim. To improve the efficiency of planning a student's learning process.

Object of research. The processes of planning and organising an individual student's learning activities.

Subject of research. Methods of distributing the student's study load between days and the architecture of the software solution/tool that implements such methods.

To achieve this aim, the following tasks were formulated:

- to analyse the problem of uneven student study load and the limitations of existing planning tools;
- to formalise the study-load distribution problem as the problem of constructing an individual schedule that takes into account task deadlines, durations and the student's available hours;
- to develop a method for automated schedule construction that splits large tasks into time blocks and allocates these blocks to days before their deadlines without exceeding the daily workload limit;
- to implement a software tool for planning the student's study load with a user interface;
- to analyse the obtained results.

Scientific novelty. The scientific novelty of the thesis lies in the development of a study-load distribution method that combines a modified EDD algorithm with the introduction of an effective deadline (deadline minus buffer), daily constraints on the number of hours and splitting tasks into blocks, as well as in the use of a specialised local optimisation procedure to smooth the daily workload. In addition, a system of metrics for evaluating the quality of an individual schedule is proposed (maximum workload, number of overloaded and "peak" days, workload variance, tasks in the risk zone), focused on the comfort and robustness of the learning process.

Practical significance. The practical value of the obtained results is as follows:

- a web application – a software tool for planning a student's study load – has been developed; it implements the proposed method and provides a convenient interface for entering tasks, availability parameters and visualising the resulting schedule;
- the implemented software tool can be used by an individual student for daily planning of personal learning activities, and can potentially be integrated as a module into existing educational support systems (LMS, calendar services, EdTech platforms);
- the application can be used in the educational process as a demonstrational example of applying scheduling theory, heuristic algorithms and web technologies to a practical study-planning task.

Relationship with scientific programs, plans and topics. The work was carried out at the Department of Informatics and Software Engineering of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute".

Approbation. The scientific results of the thesis were approbated at the IX International Scientific and Practical Conference of Young Scientists and Students "Software Engineering and Advanced Information Technologies" (SoftTech-2025).

Keywords: STUDY LOAD PLANNING, INDIVIDUAL SCHEDULE, DEADLINE, EDD, LOCAL OPTIMISATION, HILL CLIMBING, WEB APPLICATION, EDTECH.