

## STUDY AND METHODOLOGY OF SOLVING ENGINEERING PROBLEMS IN PHYSICS

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### Abstract

In this article, the educational and methodological support of the general physics course was developed based on the comparison of the stages of solving physical and engineering problems in the preparation of engineers for professional activity.

**Keywords:** physics course, competence, teaching-methodical support, educational process, model, analysis, independent work.

The creation of a model for the implementation of professional orientation of the study of the general physics course requires the development of educational and methodological support based on the comparison of the stages of solving physical and engineering problems. Based on the analysis of scientific and educational-methodical literature, it is possible to determine the characteristics of the structure of educational-methodical support in various subjects.

In the process of learning a general physics course, the educational methodological support of preparing future engineers for professional activity should fully cover the set of materials necessary for students to study a certain subject in the course of classroom training and independent work in accordance with the requirements of the State Educational Standard.

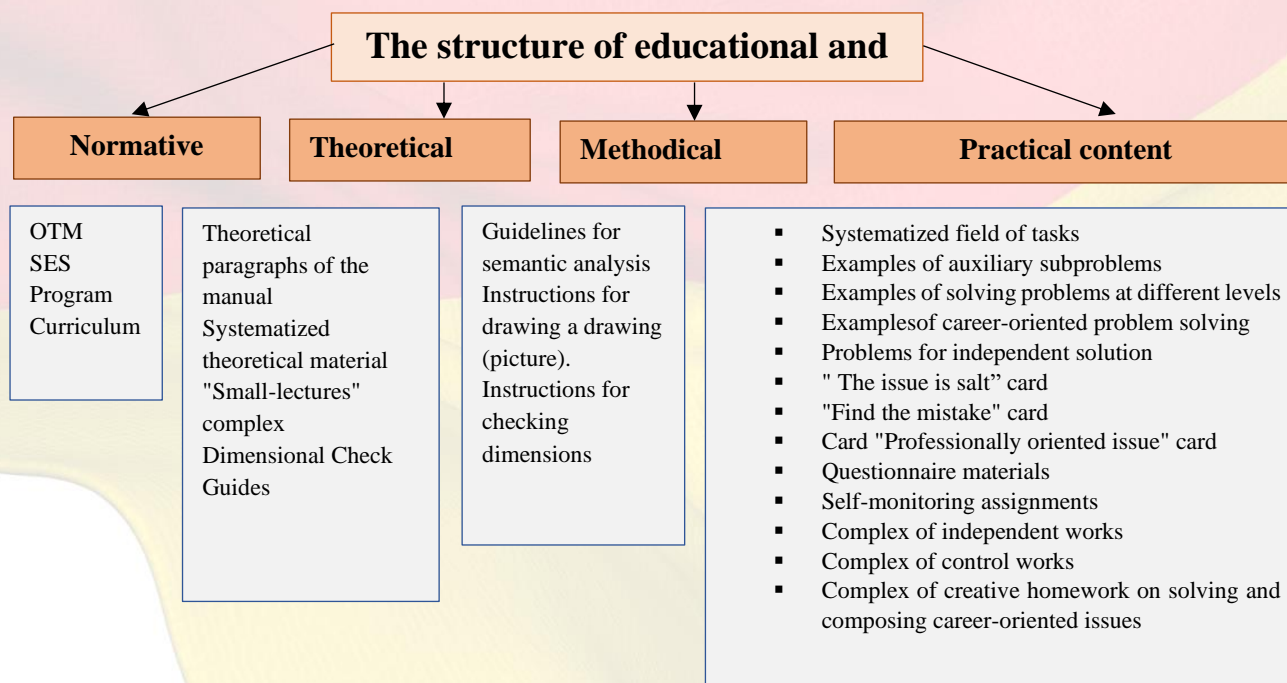
Summarizing all of the above, we define the structural elements of educational and methodological support as a means of acquiring certain components of the basic professional competencies of students as the basis of the success of future professional activity.

In addition to regulatory documents (state educational standards, programs, curricula), the modern educational and methodological support of the general physics course should include:

1. Brief theoretical information on the studied sections in order to help students in the implementation of the theoretical stage of problem solving (formation of cognitive-analytical competences).
2. Material created for independent implementation of the analytical stage of solving educational and professional tasks (formation of cognitive-analytical, knowledge competences).
3. Instructions for solving issues necessary for students' independent work (formation of cognitive competence).

5. Brief theoretical information on mathematics and informatics, which are often used by students to complete the practical stage of solving problems (formation of information-mathematical competence).
6. Questionnaire materials for searching for the necessary information and independent verification of the obtained information (formation of reflexive components of basic general professional competences).
7. Examples of solving the main types of problems to ensure independent work of students (activation of independent activity).
8. Examples of solving professionally-oriented tasks (formation of the motivational component of basic general professional competences).
9. Tasks for independent work (formation of the reflexive component of basic general professional competences).
10. Supervision and independent works (summarization and systematization of the mastered material).

In accordance with these requirements, the educational and methodological support of the general physics course was developed based on the comparison of the stages of solving physics and engineering problems.



In conclusion, in organizing the preparation of future engineer-students for professional activity, systematization and generalization of the studied material, the proposed teaching-methodical support allows the teacher to control it at every stage of its application.

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