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FORMATION OF FUTURE ENGINEERS ON THE BASIS OF HIGHER MATHEMATICS THROUGH THE USE OF INTEGRATED PROJECTS IN EDUCATION

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Annotation

Integrated Projects is a multidisciplial educational activity that integrates different disciplines such as math, science and engineering into a single project. These projects allow students to apply their knowledge and skills to solving real problems, develop critical thinking and problem-solving abilities

Keywords

Engineering problems, bridge design, integrated, integrated education projects, Differential Accounting, Integral Account, "Functions of Several Variables", "Differential Equations", "Series", "Mathematical Physics Equations", "Probability Theory", "Mathematical Statistics", "Complex Variable Functions Theory", "Operating Account".

Introduction

In the modern world, engineering has become an important area that plays an important role in the development of society. The complexity of engineering problems requires a solid foundation in higher mathematics. Therefore, it is very important to give prospective engineers a solid understanding of mathematical mathematics and their application. One effective way to achieve this is by using integrated projects in education. Integrated projects are multidisciplumnational learning activities that integrate different disciplines such as math, science and engineering into a single project. These projects allow students to apply their knowledge and skills to solving real problems, develop critical thinking and problemsolving abilities. Higher mathematics is the main work of engineering, which needs to be taught in a way that interests and appropriately interests students. Integrated projects provide practical and meaningful teaching of higher mathematics. For example, the project, which involves the design of the bridge, requires students to calculate the forces affecting the bridge and apply their knowledge of accounting, geometry and physics to determine its stability. In addition, integrated projects promote collaboration and teamwork, which are

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essential skills for engineers. In a project-based learning environment, students work together to solve complex problems, share ideas and resources, and explore each other's strengths and weaknesses.

As mentioned earlier, in the methodology of teaching mathematics to prospective engineers, special attention is paid to the organization of students' independent work, especially creative types of independent work in the form of integrated curriculum projects (IEP). IEP is understood as complex educational tasks for us, solving them requires the construction of a mathematical model of objects of the engineer's professional activities and is carried out by transferring mathematical problem solving methods to other fields of science. The system of assignments for IEP has been implemented by us in electronic textbook "Mathematics in the Professional Hierarchy of an Engineer" [4].

Let's take a look in detail at the methodology for applying integrative learning projects in the tutorial proposed in the manual.

The selection of materials for the creation of INGP was carried out from the materials set of student scientific and technical conferences

Theoretical materials for the course "Mathematical Culture of engineer" held at the Kokand branch of the Tashkent State University of Technology, such as [1,2], as well as "Higher Mathematics", are read to students of the Kokand branch of TSTU [3].

To develop an electronic textbook, the language for determining HTML hypermatics is selected. There are a huge number of programs and editors to create pages in this language. The main advantage is that code written in this language is easily opened by a standard browser that is installed on most computers. The page written in this language is familiar and familiar to any user, and the convenience of navigation makes the language even more attractive. Web design programs are the main tool for solving the problem of writing electronic textbooks in the selected HTML language. When choosing a program, we have complied with the following requirements: Russian language support, convenient interface and visual work mode. More Artisteer editors will respond to these requirements.

The manual includes the following sections: input, practical application and theoretical material. The "Practical Application" section contains professionally oriented assignments that show the use of mathematical methods and models in such fields of knowledge as physics, chemistry, geodesy, computer technology, theoretical mechanics, electrical engineering, radio, mountain industry, ecology, and manufacturing. Assignments for these same students represent the results of

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the implementation of integrative projects and may serve as the basis for developing tasks for the new IEP[5].

The section "Theoretical material" is divided into modules: "Linear and vector algebra", "Analytical geometry", "Introduction to the Analysis of Functions of a Variable", "Differential Account", "Integral Account", "Functions of Several Variables", "Differential Equations", "Series", "Mathematical Physics Equations", "Probability Theory", "Mathematical Statistics", "Theory of Functions of a Complex Variable", "Operating Account".

The sections "Practical Application" and "Theoretical Material" are interconnected through hyperlinks in accordance with the principle of networking. For each task in the "Practical Application" section, there is hyperlink to the theory needed to solve it. Thus, the connection between theory and practice can be seen immediately, which helps to increase the motivation to study the "Higher Mathematics" course by providing in-fan integration between theory and practice.

Conclusion

In conclusion, the formation of prospective engineers based on higher mathematics by using integrated projects in education is an effective approach that will help students to improve their understanding of mathematical mathematics and their application. It allows students to apply their knowledge to real problems, develop critical thinking and problem solving skills, and gain the necessary skills for their future professional activities.

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