ELECTRONIC METHODOLOGICAL COMPLEX ON THE DISCIPLINE «APPLIED MATHEMATICS» IN ENGLISH FOR INTERNATIONAL STUDENTS

O. N. MALYSHEVA
Belarusian State University of Informatics and Radioelectronics

Abstract. According to the analysis of the theoretical grounds for teaching disciplines of the mathematical cycle in the English language and foreign experience of academic and professional training of specialists was developed methodological support for the course «Applied Mathematics» in English for students studying in a multicultural educational environment. The designed electronic methodological complex on the discipline «Applied Mathematics» for the specialty 1-98 0102 «Information Security in Telecommunications» of BSUIR in English for international students is a set of lecture and laboratory classes using interactive teaching methods: the computer package Mathematica and MindMapping and training videos.

A huge role is played by intercultural dialogue in the field of education because higher education has become a global market and attracts many international students from virtually every country in the world.

Training of specialists with higher education, capable of perceiving, generating and implementing innovative ideas, creating high-tech products in the field of computer science and electronics [1, 2] is carried out by integrating educational, research and innovation activities [3].

Studying the disciplines of the mathematical cycle is designed to form a high level of fundamental mathematical training, as well as to develop the intellectual potential of future specialists in the field of computer science and electronics.

Mathematical education of a modern specialist in the field of computer science and radioelectronics includes the study of the general course of mathematics and special mathematical courses. The general course of mathematics is the foundation of the mathematics education of a specialist. Teaching special sections is focused mainly on the application of mathematical methods to solving applied problems. Applied mathematical disciplines are of interest for the training of narrow specialists.

Department of Higher Mathematics of BSUIR developed the course called «Applied Mathematics», which sets out the basic of modern Applied Algebra [4], lays the mathematical foundations of information protection from interference and unauthorized access [5]. Over the years, this course has been successfully taught to students of BSUIR specialties «Computer Science», «Telecommunication Networks», «Systems for the distribution of multimedia information», «Protection of information in telecommunications». The academic discipline «Applied Mathematics» for the specialty 1-98 0102 «Information Security in Telecommunications» is taught in English for foreign students. The course is an integral part of the specialized courses «Theory of Codes», «Digital Processing and Multimedia Information Protection» and other specialized courses. The study of this discipline is carried out in the third semester of the second year of study in the amount number of 90 hours (lectures – 32 hours, laboratory work – 16 hours, individual work- 42 hours) and is 2.5 credits.

To improve the quality of teaching the discipline «Applied Mathematics», the author designed an electronic methodological complex consisting of the following blocks.

1. The Electronic Tutorial (mini-modules from theoretical and practical materials, accompanied by links to video materials and presentations from the Internet).

2. The Laboratory Works Supporting (contents of the laboratory works, some useful computer program Mathematica functions, self instructional problems).

One of the effective methods of presenting educational material is visualization. Viewing small educational videos can facilitate perception and stimulate cognitive interest. At the same time, video materials can be either pre-prepared by the lecturer himself, or borrowed from the Internet space. The Internet site youtube.com contains a large number of training videos in the discipline «Applied Mathematics», but the teacher must select the best quality videos by previewing them. You should also choose small rollers (up to 20 minutes) to take into account the characteristics of stability of attention and students' perception of the information described in psychology.

For the purpose of visualization and improvement the structure of the records of educational materials, it is convenient to use the Mind Mapping technology [6]. Mind Mapping is one of the successful learning tools that can be used in a large number of different situations when it is necessary to study and analyze, learn and think.

Conducting laboratory classes in the disciplines of the mathematical cycle is designed to develop practical skills for solving problems on a specific topic, based on specific theoretical information. The implementation of the solution of tasks can be traditionally performed manually or with the help of modern computer technology. In the process of teaching Mathematica [7] computer package is used. Mathematica is a universal technical computer system with the capabilities of computer mathematics, which has its own programming language, publishing tools, a variety of graphical capabilities, as well as a high level of integration between all these components.

The use of interactive technologies [8] in teaching higher mathematics at a technical university is especially important, since the course contents are extensive and must be mastered in a relatively short time. It is advisable to break all contents into modules and organize effective study, consolidation and control of students' knowledge. In addition, the fundamentally important task of developing students' self-education skills is worthwhile.

The use of computer math packages during practical and laboratory classes considerably “enlivens” the learning process, helps to ensure control and self-control of the correctness of solutions of the tasks set, and visualization of the results makes it possible to give visibility to the results obtained and conduct a comprehensive analysis. You can also demonstrate its opportunities during lectures using multimedia teaching tools. Of particular interest is the use of Mathematica package when conducting research or laboratory work with students.

The possibility of using the developed approaches to conduct classes in the academic discipline called «Applied Mathematics» using interactive teaching technologies by BSUIR teachers is proved.

The designed electronic methodological complex in the discipline «Applied Mathematics» by BSUIR can be used by teachers in preparing for classes using interactive learning technologies and by the international students for guided independent learning activities. So, the designed electronic methodological complex can be used by international students to prepare for classes and perform laboratory work.

Creating a comprehensive learning experience is one of the main problems of any educational institution. The solution to this problem is to organize effective teaching for the comprehensive training of a specialist. An important role is played by both the information component of training necessary for the acquisition of all competencies (knowledge, abilities, skills) of a future specialist, and the technological component (efficiency of acquisition of competencies).

The designed electronic methodological complex for the discipline «Applied Mathematics» allow us to conclude that interactive teaching technologies improve the quality of perception, study and assimilation of educational material, as well as facilitate the use of a progressive approach in teaching modern mathematics.

Summing up the research, we can draw the following conclusions: a careful selection of mathematical disciplines for training in specific specialties and the use of interactive technologies in training allow us to prepare a highly skilled specialist in his field with the necessary set of academic and professional competencies. The learning process itself, in a broad sense, also raises the issue of the need for continuing education of the teacher himself in order to improve his qualifications. Knowledge of foreign languages, knowledge of innovative technologies, increasing pedagogical skills makes it possible to provide quality educational services in a multicultural educational space.

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