Characteristics of Teaching Theoretical Foundations of Informatics in the System of Pedagogical Higher Education

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Abstract: The article describes the methodology of teaching the subject of the theoretical foundations of computer science in the credit-modular system in the system of pedagogical higher education. It also defines the requirements and objectives in relation to knowledge, skills and competencies that students must acquire in mastering the subject.

Keywords: credit-modular system, curriculum, goals and objectives of training, knowledge, skills and competencies, educational process, modular materials

The Republic of Uzbekistan has necessitated the implementation of radical reforms in the education system because of choosing of a unique and appropriate path of economic development of the, reconsideration of the structure and content of training. Especially important in pedagogical higher education institutions is the development of integrated technologies for teaching computer science to the professional field. At the same time, it is important to clarify the principles and criteria of structuring the content of teaching the theoretical foundations of computer science in accordance with the requirements of the credit-module system, to improve the innovative-methodical system of practical mastering of knowledge in computer science.

Nowadays, the credit module system is implementing the higher education system. This, in turn, future teachers allows in the information-communication-educational environment to think independently, that is, to think, work, express themselves, self-assessment, and so on. is to teach to show.

Credit is a unit of measurement of the study load (time) spent by a student to study and master the subjects in a particular field of study or program (course). A credit is a minimum amount of time set aside by a normative document for a student to study in an auditorium and independently, usually for one week. Credit is given to a student after completing the assignments in a particular subject and successfully passing the final exam.

The introduction of this system in higher education will improve the quality of teaching, ensure transparency, eliminate corruption, reveal the true knowledge of the student and create the basis for students to study and work independently.

The introduction of a credit-module system is an important factor in the collaboration of teacher and student. In modular education, the teacher organizes, manages, advises, checks the process of mastering the student. The student, on the other hand, moves independently toward the oriented object. The greatest emphasis is placed on students' independent learning [5].

First of all, the credit-module system brings to the higher education system of our country a more perfect, modern but understandable unit of measurement than the current one. According to him, HEI curricula are divided into different disciplines and modules that focus on specific learning outcomes. Each subject or module is reflected in a certain number of credits, depending on the amount of study load in it. For example, each subject can be reflected in an average of 5, 6, or 7.5 credits. The student is required to accumulate a certain amount of credits each semester, academic year, and after accumulating the appropriate amount of credits, he is awarded a bachelor's or master's degree.

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Students will have to accumulate 30 credits per semester in the subject of theoretical foundations of computer science.

In a credit-module system, the results of a program or subject should answer the following key question: What can or should a student do after completing a program or a particular subject based on the knowledge he or she has learned in it? As you can see from this question, the learning outcomes do not consist of a list of knowledge that the student has acquired during the program or in a particular subject, but rather of what the student can do based on that knowledge.

This requirement in the credit-module system Theoretical Foundations of Informatics forms a practical, pragmatic approach to the subject.

Below we will focus on the content, purpose and knowledge to be mastered by students on the basis of the modular system of teaching the theoretical foundations of computer science, taught in the field of 60110600 - Mathematics and Informatics undergraduate education at the Nukus State Pedagogical Institute named after Ajiniyaz.

The curriculum based on the module Theoretical Foundations of Informatics has been developed on the basis of a special scheme and includes:

- full disclosure of learning objectives and tasks. The goals and objectives of the subject are clearly defined in advance, which directs all educational efforts throughout the semester to achieve these goals. Examinations are also aimed at checking whether students have achieved these intended goals;
- Requirements for the qualifications of the student, which must be acquired at the beginning and end of the subject;
- A summary (syllabus) of each subject included in the module, i.e., the topics of lectures, plans of laboratory and practical classes, assignments for the assessment of independent learning;
- Summary of teaching: methods and tools of teaching; methods and forms of knowledge assessment.

At the beginning of the semester students are given a written syllabus on the subject of theoretical foundations of computer science (identification of the subject, information about the professor, description of the course, the role of science in the formation of the student as a specialist, the purpose and objectives of science, its role in the curriculum) through which knowledge, skills and competencies, learning outcomes, teaching methods, list and plan of topics to be studied during the semester, list of literature used by students, assessment criteria) are presented and explained in detail about the subject.

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The task is to enrich the concept of information and its types, methods of representation, information processes, properties, units of information measurement, information modeling and
formalization, the nature of computer discreteness, optimization algorithms in grids and graphs and its applications, the mathematical foundations of computer science.

It also provides a general understanding of modern information technologies and their application in practice, the information society, revealing the important features and opportunities of informatization of society, the development of forms of information culture in training [2].

Theoretical Foundations of Informatics of Higher Education Institution 60110600 - The first module of the bachelor's degree in Mathematics and Informatics is called Fundamentals of Information Theory. The content of the module, the purpose and requirements for the knowledge to be mastered by students are: information, its types and forms, continuous and discrete information, information properties, methods of information representation, information coding, correct, opposite and additional number codes, modification codes and their perform arithmetic operations on, information processes, syntactic, semantic and pragmatic measurements of information, units of information, methods of obtaining knowledge, basic properties of knowledge, knowledge warehouse and expert systems.

The second module of science is called the Information Society, the content of the module, the purpose and requirements for knowledge to be mastered by students. The role of information in the development of society, informatization of education, legal framework of informatization of society and education, information culture and its formation.

Students will be introduced to the mathematical foundations of Informatics in the third module of the subject. Based on the content, purpose and knowledge to be mastered, students will be able to understand the structure of the personal computer, their information-logical basis, functional-structural organization, directions of development of computers, arithmetic bases of information processing on the computer, coding and decoding of information. must know the essence of the basics of physics. They will be able to perform various operations on positional and non-positional number systems, be able to perform elementary Boolean functions, logical operations, and be able to construct schemes and truth tables of logical elements [2].

The topics in these modules and their content are covered based on the educational goals and state educational standards, with special emphasis on the principles of scientific, historical regularity of education.

The training structure of the modules can be illustrated as follows. The purpose of the module, its relevance, data collection (creating a search algorithm and searching for the necessary data sources, working with databases, electronic resources, interviews, surveys, including foreign literature, data availability measures, etc.), data processing (text editing), systematization of collected materials, assessment of information quality), interpretation, analysis and generalization of facts (comparison with known facts, hypotheses, reasonable conclusions), result (article, abstract, report, video, etc.), presentation (report quality, discussion, reviews, etc.).

During the educational process, students are required to:

- knowledge and mastery of the basic methods of the educational process (analysis of the literature, search for information sources, data collection and processing, scientific interpretation of the results, vision, promotion, hypotheses, methods of solving them);
- computer literacy: data entry (text, graphics), use of computer telecommunications technology, processing of quantitative data obtained using spreadsheets, use of databases, printing data;
- Ability to independently combine previously acquired knowledge in different disciplines to solve existing knowledge problems in the information project.

In the course of the theoretical foundations of computer science in the form of final control requires students to actively use computer technology. This forms certain knowledge, skills and
competencies in the use of computer technology in the learning process, which in turn allows the student to have a full understanding of theoretical and practical information knowledge, as well as to develop his information skills and competencies [3].

Also, the importance of independent learning in the educational process of the theoretical foundations of Informatics in the credit-module system will increase, which will lead to increased independence, creative initiative and activity of professionals in the future. Students will always have the opportunity to get help and advice from teachers and classmates. This strengthens mutual understanding and serves to build teamwork skills.

The materials of the training module embody the knowledge that students need to acquire, and they are expressed as follows:

- taking into account the pedagogical and psychological laws of knowledge acquisition;
- developing student observation in a variety of ways;
- take into account the coherence, interest and comprehensibility of the proposed materials;
- determination of the scientific, vitality and conscious mastery of materials by students on the basis of state educational standards, etc.

In this pedagogical higher education institution developed a teaching methodology for teaching the subject of Theoretical Foundations of Informatics in the credit-module system, based on pedagogical principles in the training of future specialists.

Research shows that students studying in this system have a deeper understanding of the task, accelerate access to information, expand access to international scientific and technical databases, accelerate the process of globalization and ensure the development of independent learning of students.

It also creates the basis for the transparency of the educational process, the formation of curricula based on the needs of the economy, labor market and students, improving the quality of lessons and, finally, each student has its own independent curriculum, as well as competitive training of mature teachers.

**Literature**