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**MODERN APPROACH TO LEARNING MATHEMATICS OF STUDENTS
MAJORING IN SPECIALIZATION “SYSTEM ANALYSIS”**

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Modern Approach to Learning Mathematics of Students Majoring in Specialization “System Analysis”

The article deals with peculiarities of teaching mathematics for students majoring in “System Analysis” in the universities. To improve the system of higher mathematics teaching were analyzed existing systems of mathematical training in computer and engineering faculties of the university, which has allowed us to identify a number of shortcomings. Textbooks, manuals and books of problems in mathematics, which are recommended for students in work programs, in most cases, classical, created more than twenty-thirty years ago. The authors found that the mathematical discipline for students majoring in “System Analysis” in higher educational institutions both in content and teaching methods often is a copy of courses of “Mathematic” in the mathematical and physical faculties in the traditional universities or higher education institutions, which greatly reduces the effectiveness of training. These professionals need fundamental knowledge in mathematics, because this branch of science is studies mathematical methods for analysis and synthesis of complex systems based on a systematic approach, including methods of decision making under uncertainty, and solving multi-criteria problems. Therefore offered to students studying disciplines cycle, those are aimed at students with assistance in learning the basics of mathematical tools needed to solve theoretical and practical problems. The authors are distinguishing most difficult questions what arise in the process of teaching of Mathematics and its components on the above mentioned specialties.

Key words: systems analysis, mathematical disciplines, content.

A successful person in the modern world should focus by the turbulent flow of science and technology. The greatest height achieved in most cases, those who are not just passive users of new technologies, but also can improve or create their own innovations. According to the International HR portal HeadHunter in Ukraine is a lower value of index hh (the ratio of the number of Curriculum Vitae to job

vacancies) is the largest demand Specialists have traditionally been in such areas: “Sales”, “IT, Telecom”, “Production», “Medicine” and “Insurance”. According to statistics by far the most prestigious is the profession of IT-specialist (27%), and this is not surprising, because they are well demanded. In addition, a job of programmers and analysts are highly paid: the average salary in IT is about 15 000 uah [1].

The purpose of our work – to identify the major problems of teaching higher mathematics course for students majoring in “System Analysis” in the Ukrainian Universities.

Training of specialists with relevant qualification is feasible and promising. For example, the graduates of Donetsk National Technical University in “System analysis and management” ready to work as system analysts, solve the problem of designing and implementing information systems and management. Graduates can work:

- systems analyst and project manager in companies specializing in the implementation of information systems (IS, MBS Axapta, etc.);
- leading expert of analytical and planning departments of banks, insurance companies and other institutions;
- specialist in the analysis and monitoring of control systems and software design, engineering and scientific organizations;
- consultant for optimization and intellectualization of industrial and financial activity.

These professionals need fundamental knowledge in mathematics, because this branch of science studies mathematical methods for analysis and synthesis of complex systems based on a systematic approach, including methods of decision making under uncertainty, and solving multi-criteria problems. Therefore offered to students studying disciplines cycle, those are aimed at students with assistance in learning the basics of mathematical tools needed to solve theoretical and practical problems.

Before lecturer is a problem develop in students the skills of mathematical research applications, to instill in students the ability to self-study books on mathematics and its applied aspects. So at Donetsk National Technical University the

professional knowledge of graduates are formed while studying the following educational blocks:

- subjects Science Training (mathematical analysis, linear algebra and analytic geometry, physics, discrete mathematics, functional analysis, probability theory and mathematical statistics, etc.);
- methodology of system analysis and synthesis of control systems (systems analysis, systems modeling, optimization techniques, design of information systems, project management, data analysis, control theory, etc.);
- modern information technologies and software (computer software, algorithmic and programming language, object-oriented programming, databases, computer architecture, Internet technologies, etc.);
- economic training subjects (economics and industrial engineering, logistics, financial and actuarial mathematics, accounting, book-keeping, financial management, analysis of industry, banking, etc.);
- enterprise management systems (based on 1C: Enterprise) [2].

Thus the problem of increasing the effectiveness of the mathematical training of specialists organically connected with the peculiarities of their future profession. The course of higher mathematics for engineering and computer departments of higher educational institutions both in content and teaching methods should not copy the course of higher mathematics in the mathematical and physical faculties of traditional universities.

To improve the quality of education being developed different approaches to the educational process in higher education, curricula are changing majors, and as a result, changing work programs in disciplines including mathematics. That problem is the content of the mathematics and dispensation curriculum (classroom and non classroom) is relevant.

The problems of the educational process in higher education finding ways to improve training dedicated research of many scientists. Researchers of this problem are actively A. Voivod, N. Losev, V. Motorin, V. Shvets and many others. However,

there are some problems that hinder the quality of the learning process of mathematics.

First, this is a contradiction between the capacity of the traditional system of training and the needs of modern society engineers adapted to the various aspects of professional activity, capable of self-education and continuous dynamic training.

Secondly, the insufficient practical is developed, modern trends in the development of higher vocational education (student-oriented and developmental learning activity approach, etc.) in teaching mathematics and computer engineering majors [3] and others.

To improve the system of higher mathematics teaching were analyzed existing systems of mathematical training in computer and engineering faculties of the university, which has allowed us to identify a number of shortcomings.

We compared rates of component parts of Mathematics specialties “Mathematics”, “Physics”, “science”, “System Analysis”, “Computer Engineering” and “Software Engineering”. As it turned out, usually a course of higher mathematics read classically, without application oriented subject. The difference is only in the amount of time on one or the other section for specialty “Mathematics”. So when dealing with analytic geometry theme of “Lines of the second order” studied the same on all of the above specialties, qualitative differences specific to future specialist is only possible to self-study student themes.

Textbooks, manuals and books of problems in mathematics, which are recommended for students in work programs, in most cases, classical, created more than twenty-thirty years ago. For example, almost every teacher recommended books edited by I. M. Gelfand, A. B. Efimova, P. S. Alexandrov, A. B. Pogorelova, B. P. Demedovycha and others that certainly is a classic mathematical library, but do not reflect the specifics of the current approach to mathematics for computer and technical specialties. Or proposed guidelines contain only exercises the computational nature with particular application to solve professional problems [4].

Thus, we have analyzed some of the problems which, in our opinion, the teachers and students of the specialty “System Analysis” have in professional training

during the process of studying at the university. However, this issue, in our opinion, requires further analysis and detailed study.

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Особливості викладання математичних дисциплін для студентів спеціальності «Системний аналіз»

У статті розглянуті питання особливостей викладання математичних дисциплін для студентів спеціальності «Системний аналіз» у ВНЗ. З метою вдосконалення системи навчання вищої математики було проведено аналіз існуючих систем математичної підготовки на комп'ютерних та технічних факультетах ВНЗ, який дозволив виявити ряд недоліків.

Авторами встановлено, що математичні дисципліни для студентів спеціальності «Системний аналіз» у вищих навчальних закладах як за змістом, так і за методами навчання найчастіше копіюють курси вищої математики математичних і фізичних факультетів класичних університетів, що значно зменшує ефективність підготовки фахівця. Підручники, посібники та задачники з математики, які рекомендовані для роботи студентам у робочих програмах, у більшості випадків класичні, створені більш ніж двадцять-тридцять років тому. Студенти спеціальності «Системний аналіз» повинні вивчати математичні методи аналізу та синтезу складних систем на основі системного підходу, бо спеціалісти даного профілю мають знати та володіти методами прийняття рішень в умовах невизначеності, а також вміти розв'язувати багатокритеріальні задачі. Авторами виокремлено основні труднощі, які виникають у процесі викладання курсу вищої математики та її компонентів на вище згаданих

спеціальностях.

Ключові слова: системний аналіз, математичні дисципліни, змістовне наповнення.

Кривко Я. П., Коваленко Е. В.

Особенности преподавания математических дисциплин для студентов специальности «Системный анализ»

В статье рассмотрены особенности преподавания математических дисциплин для студентов специальности «Системный анализ» в ВУЗе. С целью совершенствования системы обучения высшей математике был проведен анализ существующих подходов к математической подготовке на компьютерных и технических специальностях вузов, который позволил выявить ряд их недостатков. Авторами установлено, что математические дисциплины для студентов специальности «Системный анализ» в высших учебных заведениях, как по содержанию, так и по методам обучения чаще всего копируют курсы высшей математики математических и физических факультетов классических университетов, что значительно уменьшает эффективность подготовки специалиста. Учебники, пособия и задачки по математике, которые рекомендованы для работы студентам в рабочих программах, в большинстве случаев классические, созданные более чем двадцать-тридцать лет назад. Студенты специальности «Системный анализ» должны изучать математические методы анализа и синтеза сложных систем на основе системного подхода, потому что специалисты данного профиля должны знать и владеть методами принятия решений в условиях неопределенности, а также уметь решать многокритериальные задачи. Авторами выделены основные трудности, которые возникают в процессе преподавания курса высшей математики и ее компонентов на вышеупомянутых специальностях.

Ключевые слова: системный анализ, математические дисциплины, содержательное наполнение

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