Introduction

The sphere of human activity is constantly expanding, thus enriching the terminological vocabulary of a specialist in any kind of activity. There is no area of research (from engineering, economics to psychology and linguistics) in which mathematical methods are not useful.

Another characteristic of various kinds of contemporary intellectual activity is its globalization. English language has now become the language of international communication between engineers and technicians. Therefore, the authors of the proposed tutorial aim at providing English-language literature to Ukrainian and foreign students of engineering and technical specialties. Special terminology in various fields of engineering is being formed, for the most part, on the basis of the English-language version. Introduction of English terminology will enhance the qualification level and competitiveness of university graduates in the labour market.

Linear algebra and analytic geometry form the first link in the formation of the mathematical education of students of engineering and technical specialties. Knowledge in this subject will form the basis for studying mathematical subjects such as mathematical analysis, theory of probability and mathematical statistics, discrete mathematics, etc.

The proposed course aims at familiarization of the students with the main materials of the theory of matrices, systems of linear algebraic equations, vector algebra. Several sections which are devoted to analytical geometry allow the student to understand the relationship between a geometric line (figure, surface) and an algebraic equation in an appropriate number of variables and of appropriate order.

The text uses some special features and designations that, according to the authors, will help students in mastering the following material:

- all basic statements are highlighted in italics, and new terms in bold type;
- the most important formulae are boxed;
- the word "definition" is replaced by the symbol ◉.

We draw your attention to the importance of the following symbols: □ designates the beginning and ■ the end of the reasoning.

In modern mathematics, algebra is a science dealing with written in symbolic form operations. The operations can be conducted on entries of some sets. In this course, we shall consider sets of matrices and sets of vectors; the defined for them operations will be also considered here.

Linear algebra is a part of algebra, which "is simultaneously one of the most ancient and one of the newest branches of mathematics" (N. Bourbaki "Essays on the history of mathematics." – Moscow: The Publishing House of Foreign Literature, 1963). Apparently, the first problem of linear algebra was to find the solution of the equation of the form $ax + b = 0$, that is the solution of linear one. Nowadays, equations of such a kind are called equations in one variable. As is known, the issues of correctness of this problem, the existence of its solution, and the search for "the best solution" for certain practical reasons, depending on the nature of the quantities a and b, are relevant today.