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Course Construction of Linear Algebra

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Abstract: Linear Algebra is a required course for science, engineering, economics and management majors, and a required course for the postgraduate admission test. It plays a fundamental role in undergraduate teaching and provides a theoretical basis for subsequent courses. Linear algebra mainly discusses the theory and method of linear relations in finite dimensional space, mainly including determinant, vector, Matrix, equations, quadratic form, linear space and so on, it plays a vital role in training students' ability of abstract thinking, logical thinking, spatial imagination and solving practical problems by mathematical modeling.

Keywords: *Teaching objectives; Teaching methods*

I. LINEAR ALGEBRA TEACHING OBJECTIVES

Linear Algebra is an important tool for learning and mastering modern scientific knowledge. Through the study of this course, the coordinated development of students' knowledge, ability and quality will be realized, and the following goals will be achieved.

Knowledge goal: Master the basic concepts and methods of Algebra such as determinant, Matrix, system of linear equations, quadratic form, etc. , it provides a solid foundation for follow up courses as well as national math competitions, national Mathematical Contest in Modeling, and Master's exams.

Ability goal: Has the strong abstract thought, the logical inference and the algebra operation ability, can use the algebra theory and the method depth analysis question, carries on the inquiry study ability; Ability to solve complex problems with Algebra knowledge and ideas; good team communication and collaboration skills.

The quality goal: Has the bold to question, the brave innovation consciousness; has the truth-seeking, the rigorous science, the Veronica Guerin mathematics spirit.

II. LINEAR ALGEBRA TEACHING METHODS

In the teaching process according to the curriculum content and the student's actual situation may choose the teaching method to have the following several kinds:

(1) The heuristic teaching: highlights the teaching content background, emphasizes the teaching effect the application, the heuristic teaching method can step by step, layer upon layer of in-depth explanation, so that students with questions to listen to the class, mobilize students to think positively. For example, when we talk about the inverse of a matrix, we first introduce the operation of numbers, and then introduce the definition of the inverse matrix. For example, if a vector group is linearly related, if it is partially related, then it is globally related; if it is globally related, then it is partially related.

(2) Case method: by posing real problems and establishing mathematical models, students can refine their knowledge in the process of analyzing and solving problems, improve their ability of integrating theory with practice, and understand the practical application of theoretical knowledge. Using the question to drive the teaching, stimulates the student's study enthusiasm, strengthens the discussion exchange, increases the independent study, the promotion study applies and the innovation activity.

(3) Comparative Analysis: It is based on some aspects of two objects, deduce that they also have similar or the same properties in other aspects. For example, the concepts of determinant in Chapter One and Matrix in chapter two are completely different. By using the method of comparative analysis, the differences and similarities between the two are analyzed. By using the method of comparative analysis, students are more receptive to new concepts and knowledge, and distinguish between the differences in the future use is not easy to confuse.

(4) summary and induction: grasp the core content of the course, emphasize the consistency of knowledge, be good at summary, strengthen the application of key methods. After learning the determinant in chapter 1, we will review what we have said, first introducing the second-and third-order determinant, then extending it to the n-order determinant, then introducing the properties and operations of the determinant, and introducing the Cramer's rule in the calculation method, it can also be made clearer with the aid of a knowledge framework. By summing up the knowledge learned, the seemingly independent knowledge points closely linked, so that students form a knowledge chain, is conducive to the future to develop the habit of summing up to work.

(5) abstract materialization: when there are many definitions and theorems in the course of teaching, students often find the knowledge abstract and difficult to understand, the idea of definition and theorem is embodied in the examples to enable the students to find the key points of knowledge. In addition, we can flexibly use such teaching methods as rain class, turn over class and group discussion to carry out teaching activities according to the actual situation. Encourage students to make full use of online teaching resources for autonomous learning.

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