"Signal and System":Thinking and Practice of the Teaching Reform

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Abstract. "Signals and systems" course plays a vital role in the teaching of electrical professional class, the teaching quality is directly related to the students' understanding and analysis of the important concepts of signal and system's ability to solve problems, related to the quality of teaching the following courses. According to the characteristics of the course, adjust the curriculum system, teaching content, enriching teaching methods, highlighting the combination of theory and practice and strengthen the practice of teaching a series of curriculum reform, introduced the "MOOC" and "micro class" model in the teaching of "signals and systems" in the teaching reform attempt. According to the characteristics of the course, the reform measures of the teaching methods and means of the course are put forward. In teaching methods, MATLAB simulation examples, network teaching and learning are combined to enable students to grasp the basic theory of signals and systems, and improve students' ability of comprehensive analysis and problem solving.

Introduction

"Signals and systems" as the basic theory of signal analysis and system analysis, is an important professional basic course of electronic information majors. The course is based on the courses of higher mathematics, complex function and circuit principles. This course is the "automatic control principle", "modern control theory", "computer control" and other professional courses, and at the same time in the professional teaching plays a vital role, its teaching quality directly related to the understanding and analysis of the students, such as important signal system concept to solve the problem the ability to follow a course of teaching quality. Therefore, it is very necessary to improve the quality of teaching. At the same time, this course is very theoretical and requires a solid foundation of mathematics. Many students are very difficult to learn. Especially, some students in our college are weak in basic knowledge and have generally ability to analyze problems[1].To solve this problem, we adopted the following aspects of reform, to minimize the formula, increase the subjects and engineering examples, increase interest in learning more to achieve the purpose of learning. This article mainly discusses the teaching contents, teaching methods, teaching methods and practical teaching links in this course.

Adjust the Curriculum System and Optimize the Teaching Content

The teaching content of "signal and system" can be summed up in a nutshell: two kinds of systems, two kinds of methods, and three major transformations. The two kind of system which is the course of study can be divided into continuous time and discrete-time systems of two kinds according to its processing object; two kinds of method refers to the analysis methods used in the course can be divided into the time domain analysis method and transform domain analysis method of two kinds; the transform domain analysis using three kinds of transformation methods three transform, such as Fourier transform, Laplace transform and Z transform [4]. These contents are closely related and permeated with each other, and have their own independent research methods, research objects and research purposes. It is important to properly handle the problem of content cohesion to ensure the quality of "signal and system" teaching and to improve the ability of students to use theoretical knowledge.

Because many concepts in signal and system have corresponding physical models in circuit analysis, we should pay attention to the relationship between these concepts and physical models in teaching. For example, in the process of explaining "two order band-pass filter ", not only to explain its time-frequency characteristics and analysis method, and using circuit analysis" passive and active design design two order band-pass filter ".In this way, mathematical analysis and physical realization are closely integrated.

Enriching Teaching Methods and Means

Deep out, Desalination of Mathematical Deduction and Strengthening the Concept of Physics. On the one hand, we should use mathematical tools to guide students to grasp the essence of signals and systems theory and methods quickly. On the other hand, we should focus on explaining the physical concepts and methods reflected by mathematical abstraction. In this way, students can understand the essence of the course content from the abstract to the concrete, and master the essence of the curriculum. At the same time, multimedia courseware vivid illustrations, classroom informative and traditional teaching in the progressive logic, undulating rhythm of teaching and flexible classroom regulation methods organically, but full use of multimedia teaching means, there are also some shortcomings: the retention time of information in short, is not conducive to the associative memory and cognitive level, the amount of information is too large, it is difficult for students to accept,but the combination of the two, for the logical inference process, answer questions, and so on,First, the traditional blackboard writing method is used to deduce. After establishing the qualitative concept of students, Flash animation is used to show the whole solution process, which not only deepens students' understanding of content, but also deepens the understanding of knowledge and difficulties. In some chapters, the teaching methods of MATLAB simulation environment are used to improve the teaching effect and improve the quality of teaching. The way to deal with the key and difficult points of signal and system courses is to combine theory with practice, with strict theoretical system and vivid engineering examples. The introduction of basic concepts and basic methods is emphasized, and the concept of engineering application is introduced in theoretical derivation. In the case analysis, we strengthen theoretical concepts and deepen students' understanding and understanding of signal and system theory.

New Teaching Methods, "MOOC"and "Micro Class". At present, students have mobile phones and computers, and new teaching methods such as "MOOC" and "micro class" have been introduced into classroom, which is also applicable to the course of signal and system. Students who do not understand or do not listen carefully in class can continue to study on the Internet. This gives the students a space for self-study and provides a platform for students who want to learn. At the same time, the difficulty and examples, have the corresponding micro lesson curriculum platform. This new way is also more popular with the post-90s students. Arrange appropriate exercises to deepen the understanding of the content of the course. In the course of teaching, some difficult questions are selected to examine the students and find out the problems in the students' learning. Each chapter of the exercises, focusing on more questions through the "micro class" way to explain thorough explanation, deepen the understanding of the theoretical knowledge[6].

Reform of Practical Teaching

In order to cultivate high-quality talents, experimental teaching is essential, in experiment teaching, the method of hardware experiment and simulation software combination, change the traditional experimental methods, effectively realize the new teaching goal, improve the comprehensive ability of students to apply their knowledge to analyze problems, cultivate the spirit of cooperation and innovation consciousness. Through the explanation of specific application of signal processing in

prediction of wind power, make students more understanding of the signal processing [2,5]. The experiment is from easy to difficult, and has set up zero input response and zero state response, sampling theorem, two order system characteristic test, analog filter analysis, grid connected influence on power system application experiment [3]. The hardware experiment is completed in the laboratory, and the software experiment students finish their spare time by themselves.For example, the problem of extracting the fundamental component, the two harmonic component and the three harmonic component in the periodic square wave can be achieved either by hardware or by software The experimental content embodies many levels, mainly completes the continuous system experiment, and the discrete system experiment is completed in the digital signal processing course. The experiment emphasizes the process and requires students to use theoretical knowledge to analyze the results of the experiment. The exploration style is used to cultivate the students' innovative consciousness, so that the students' comprehensive ability can be greatly improved in the process of experiment [7].

Conclusion

In this paper, according to my teaching experience, some reform attempts have been made on the course teaching of "signal and system".The practice results show that these reforms are correct.The purpose of the teaching reform of the "signal and system" course is to enhance the students' interest in learning, to strengthen the students' practical ability and to improve the quality of teaching. As well as some problems encountered in curriculum teaching, combined with its own teaching process, we summarized the thinking and teaching methods of curriculum teaching reform, so as to provide experience for further promoting the reform and practice of "signal and system" course. Only by making clear the goal and grasping the key can we achieve a satisfactory effect of teaching reform.

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