

Study of Teaching Reform at Course of Electromagnetic Field and Electromagnetic Wave

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Keywords: Teaching reform; Electromagnetic field and electromagnetic wave; Simulation experiment; Innovation ability

Abstract. The course of electromagnetic field and electromagnetic wave is the specialized basic course in the department of Electrical & Communication engineering in the college. To improve the the quality of teaching, the modernization theory and measures may be appropriate for the teaching reform. We carry out teaching reform in the curriculum of electromagnetic field and electromagnetic wave. This paper discusses the appropriate methods or other techniques in the teaching process, including the selected textbook, adjusting teaching methods to the course content, or other technique. That is mainly depended on the effect of teachers' guidance. We can analysis students' knowledge base points and change the part of the course material. Students are required to master the basic method of analyzing problems. Under the premise of respecting to teach the attitude of scientific theory and method on knowledge, teachers use the specific teaching methods and let students accept and digest effectively. According to the experimental teaching reform revelation, teachers set up the computer simulation experiment for the simulation characteristics are the core of teaching auxiliary experiments. The simulation experimental reform has proved that it has effect to study the idea and method to solve the problem and turn it into the innovation ability.

Introduction

The curriculum of electromagnetic field and electromagnetic wave is one of the basic course of electronic information and communication engineering specialty. It has a very important position in the professional training plan. Teachers pay attention to combine theoretical and application in the teaching process and select the appropriate teaching materials, streamline the theoretical derivation and adopt appropriate teaching methods to better complete the course teaching quality.

Teaching Material System

The professional course of electromagnetic field and electromagnetic wave has very theoretical information and the version of the existing teaching material is more. So we can choose the relevant teaching system. The textbooks of different version cover the required knowledge, but the different teaching material system of knowledge has instruction on the structure of the electromagnetic field and electromagnetic wave knowledge system. It displays two main ideas:

One is a kind of static field after alternating electromagnetic field of knowledge. Mr.Xie prescription<electromagnetic field and electromagnetic wave>(3) gradually introduce electrostatic field, the constant magnetic field and time-varying electromagnetic fields, the system and course of college physics, relatively traditional, better knowledge, easy to accept. But with the course of college physics in the electromagnetism of pure theory to discuss many, learning will feel boring. The knowledge system of general cognitive law, starting from the basic law, the biot-savart law and Faraday's law of electromagnetic induction, deduction of static field characteristics, step by step process time consuming more, so the content of time-varying electromagnetic field is compressed.

Another kind is alternating field before the static field and is given priority to with alternating field teaching material system. From the equations of Maxwell, the paper first time varying the theory of

electromagnetic field, and then the static field due to the special case of time-varying electromagnetic field in the theoretical system after the part of the study. With such knowledge system by the more general to the specific cognitive law, emphasis be time-varying electromagnetic fields, the demand is higher, the student is not easy to master.

Based on the practice teaching in our school, we choose Xi'an University of electronic science and technology publishing house Mr. Wang Jia-li <electromagnetic field and electromagnetic wave> (3) as materials. For encyclopedia content concise, clear concept, we pay attention to the practicality and novelty. It can be used as institutions of higher learning undergraduate communication electronics related course materials of electromagnetic field and electromagnetic wave.

Teaching Content and Teaching Method

For the teaching process, the important is how to organize teaching, integration and expression of teaching content, curriculum teaching improve and reform. In recent years in general compression school under the background of professional courses, how to seize the key points and difficulties, detailed explanation, highlight the characteristics of engineering professional teaching content, the implementation of the key lies in how to organize the teaching and implementation plan.

The choice of teaching material is the xi 'an university of electronic science and technology press Mr. Wang Jia-li <electromagnetic field and electromagnetic wave> (3). It is divided into eight chapters, the content including: vector analysis, electrostatic field and constant current of electric field and magnetic field, electrostatic field, time-varying electromagnetic field, plane electromagnetic wave, electromagnetic wave radiation and guide line of the electromagnetic wave [1]. According to the characteristics of the engineering professional work out teaching outline, and then on the basis of reasonable arrangement of teaching content and teaching schedule, outline of successive electromagnetic field. We pay attention to in the process of teaching, linking to the electromagnetism course teaching content adjustment according to actual condition and difficulty in teaching implementation process embodies the importance of time-varying electromagnetic field theory content throughout the course.

Highlight Emphasis and Difficulty of Course Content. According to the characteristics and social needs, we discussed the basic framework and its prop of specialty's practical teaching system. We must be focused in the teaching, break through the difficulties. In the teaching process teachers want to do this, first of all, clear the teaching purpose of each section every chapter and specific requirements. In the electromagnetic field and electromagnetic wave curriculum deliberation, we aimed at the course status and role in students' knowledge system for the discussion and research, a clear understanding the importance of the course in the whole knowledge system, and the leading course and subsequent courses should have clear grasp, to student's knowledge base points were analyzed. Adjusted the part in the teaching, the guide line of the section elements of electromagnetic wave back to subsequent courses such as the microwave technology, so that in the existing short period under the condition of the electromagnetic field and electromagnetic wave curriculum highlights the contents of the time-varying electromagnetic field theory are discussed.

Streamline Connection of Knowledge System. The characteristics of the electromagnetic field and electromagnetic wave curriculum are the abstraction of physical concept, mathematics method the demand is a high ability training courses. The students master the basic method to analyze and solve problems, the main effect lies in teachers' classroom teaching and guidance. Teacher uses the specific teaching methods, teaching means to reflect, with respect to teach the attitude of scientific theory and method on knowledge, let the students can accept and digest effectively, and at the same time subtly impart to students the idea and method to solve the problem, and turn it into a student's own innovation ability. We are in the process of teaching in accordance with the syllabus set by the benchmark, fully studies the whole process of teaching and teaching material first rely on teaching material and teacher own teaching experience and teaching skills, teaching is teaching and learning in the teaching material

is easy to grasp the content of fine interpretation, and integrate the content of the course teaching and adjustment.

Perfect the Experimental Course

With teachers of other college discussing the teaching activity and exchanging the experience, we research the course of specific implementation. In many school the content of the useful computer analysis of electromagnetic field simulation is introduced. So we open the simulation experiment, can at the same time of master the basic concepts, cultivating the students the practical application of knowledge and the ability to solve the problem.

The experiment courses require students complete the contents of experiment within the prescribed time and specified conditions. The limited conditions for the electromagnetic field and electromagnetic wave curriculum experiment equipment cannot be perfect to open all the experiment course. We research the other college courses in the electromagnetic field and electromagnetic wave of specific implementation, selected for understanding the teaching material and teaching situation. According to the teaching reform at home and abroad, the computer simulation experiment of electromagnetic field and electromagnetic wave is set up in the experiment teaching. Choose to use MATLAB simulation software. Through specialized software modeling and software simulation teachers appropriate topics for students to practice and enhance the ability of students to solve practical problems of autonomous learning and exploration. The simulation experiments of Electromagnetic field and electromagnetic wave course use the network experimental platform for simulation. With the consolidation of the experimental steps, students can carry out the network experimental operation, exercise independent analysis ability.

The content should be based on the theoretical knowledge involved in the teaching system, experimental equipment has been combined with the characteristics and laboratory of electric information specialty, to complete the construction of experimental teaching system of professional courses and the purpose of making experimental curriculum outline. We set up the experimental project and simulation module and the the basis for the classification of verification experiments. We research comprehensive design experiment to improve quality of the experiment. The content of the basic verification experiment is arranged by the teachers. The main content is the research of the theoretical knowledge and the correct operation method. In which the electromagnetic field parameters and characteristics of the basic measurement methods of the training experiment, so that students master the standard operation of the experimental equipment, and the correct acquisition, processing methods of experimental data. And comprehensive design experiment is based on the content of teaching theory, and combining with the experimental practice. In order to make the students understand and master the theory of electromagnetic field and improve the comprehensive utilization of the professional technology and the engineering practice ability. Relying on teachers scientific research and application practice, put forward professional problems and direction of study for students, guide students to participate in the study and to carry out the project. That can reach the object of the combination of teaching and scientific research to cultivate independent research, innovation and development of education.

Conclusion

The course of electromagnetic field and electromagnetic wave has the core position in electronic information and communication engineering professional training system. It is one of the basic courses of related majors and a very important course for professional and technical personnel.

We confirm the fundamental status of the course, teaching exploration in many aspects. In mining problems in the teaching process, and timely adjustment in order to solve the problem, and meet the needs of subsequent courses, overall realization of the electromagnetic field and electromagnetic wave curriculum teaching reform.

Acknowledgement

Thanks for the support project: the Education Department of Jiangxi Province GJJ14743 and JXJG141712.

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