Comprehensive Reform and Practice of Digital Electronic Technology Course for Applied Undergraduates

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Abstract. The digital electronic technology course is a basic course for electrical, electronic information, instrumentation and other specialties. It is a basic course of core technology about the application of electronic technology. According to the characteristics and development status of digital electronic technology course, combined with the training objectives of applied talents, this paper explores the comprehensive reform of digital electronic technology course from the aspects of course textbook construction, teaching method research, theory and practice teaching system construction and ability training of engineering quality training. The principle of combining theory with practice is carried out in the course structure. The theory teaching strives to be concise. It requires mastering concepts, strengthening application and highlighting engineering features. Practice teaching pays attention to ability. It requires gradual progress. It implements from confirmatory experiment to comprehensive design experiment in experiment, and introduces computer simulation technology. We should adhere to the principle of student-centered, carry out the idea of subjectivity education, change the traditional teaching concept, teacher-student relationship and teaching methods, and strengthen the spirit of innovation and innovation consciousness. We actively explore project-driven, inquiry, discussion, participation and other teaching methods for teaching. The research has a certain reference significance for the construction of applied undergraduate digital electronic technology courses and related courses under the background of transformation in the paper.

Introduction

The digital Electronic Technology is an important professional basic course for electronic information specialty. It is widely used in TV technology, radar technology, aerospace, communication technology, computer, automatic control, digital products and other fields. This course has three distinct characteristics which are completeness, practicality and applicability. Through the study of this course, students need to master the ability of development, design, detection and debugging of digital circuits. In the past, traditional teaching cannot adapt to the training of applied talents. For the training of applied talents, we need to pay attention to practical ability and innovative ability [1, 2, 3, 4, 5].

The digital electronic technology is a course with rapid development, strong practicality and application. According to the characteristics and development status of digital electronic technology course, combined with the goal of cultivating applied talents, using modern education and teaching theory, further optimize the teaching mode, explore new teaching methods and means, and pay attention to theory. Combining with practice, it should become the thinking of comprehensive reform of digital electronic technology curriculum. The fundamental task of the comprehensive reform of digital electronic technology curriculum is to train applied talents. The goal of the comprehensive reform of applied undergraduate curriculum is to cultivate social needs and professional abilities. We should vigorously strengthen the teaching reform, comprehensively promote quality education, and establish an innovative talent training system. This should be the objective of the comprehensive reform of applied undergraduate curriculum [6, 7, 8, 9].
Construction Contents

Course Textbook Construction

We have published Curriculum textbooks suitable for the cultivation of applied talents and formed a complete curriculum knowledge system. The textbook aims at cultivating applied talents, stressing the teaching idea of combining theory with practice closely, giving priority to practicality and emphasizing practice. Therefore, in the selection and compilation of the content, the textbook stresses the key points and clarifies the basic concepts, basic knowledge and basic methods of digital circuits, especially the basic concepts of logical algebra, integrated gate circuits, combination logic circuit, integrated flip-flop and sequential logic circuit are the key points of this course. This book has greatly reduced the narrative of separation components, highlighted integrated circuits, while reducing the introduction of the internal structure of integrated circuits, focusing on the introduction and use of integrated circuits. As the application specific integrated circuit (ASIC) is a new logic device developed rapidly in recent years. In particular, programmable logic devices (PLD) have been widely used in the design of digital systems. Therefore, this part has been strengthened in the process of compiling, which lays a foundation for the development and design of digital systems using these devices. This book applies Multisim 10 software simulation design to each chapter, so that students have a basic understanding of the basic application and engineering design of Multisim 10 software, which is helpful to cultivate students' innovative ability. The textbook was published by Nanjing University Press in 2013 and won the first prize of Excellent Textbook of China University Publishing Association.

Research on Teaching Method

To stimulate students' interest in learning and improve teaching effect, a variety of teaching methods and means have been established. In recent years, according to the new concepts of higher education teaching reform and school education reform, digital electronic technology curriculum actively constructs the reform of teaching methods with the leading goal of promoting students’ knowledge innovation and ability cultivation, and explores the teaching research and practice of heuristic teaching, problem-based teaching and project-based teaching. The use of these methods and means improves the teaching effect and promotes the further improvement of the quality of personnel training.

Construction of Theory and Practice Teaching System for Engineering Quality Training

In order to meet the requirements of training applied talents, the teaching content has been optimized and integrated, which ensures the systematicness, scientificity, advancement and practicability of the curriculum content system. The curriculum system of theory teaching, hardware experiment, simulation experiment, curriculum design and network teaching has been formed.

Constructing the Experimental Teaching System of "One Skill, Three Levels and Five Modules" with Ability Training as the Core

Relying on the provincial demonstration center of electrical and electronic experiment teaching, digital electronic technology laboratory actively increased investment, the scale of laboratory continues to expand, and teaching instruments and equipment are advanced and complete. According to the actual situation of different students, a new experimental teaching system of three-level courses has been established, which is from foundation to frontier, from accepting knowledge to cultivating comprehensive ability, and gradually improving from "basic-improving-research and innovation." It can be summarized as "one skill, three levels and five modules." Moreover, the selection and optimization of research-oriented experimental projects can reflect the frontier of high-tech and scientific research achievements of our university to broaden students' horizons, and improve students' design ability and research ability.
One Skill. The skill experiment course highlighting the characteristics of electronics specialty focuses on the combination of electronics technology and components, the use of test instruments, integrated circuit chips, schematic diagrams and circuit board fabrication and other aspects of experimental teaching, so as to cultivate students' solid professional practical basic skills.

Three levels. According to the aim and requirement of the experiment, each experiment is divided into three levels: elevated experiment, comprehensive design experiment and innovative experiment.

Five Modules. The experimental course of digital electronic technology is divided into five modules: component level experiment, unit circuit level experiment, system level experiment, comprehensive research level experiment and University Students' scientific research and innovation level.

Course Website Construction

Fully relying on the campus network, the original digital electronic technology course website is further improved. The content of the course website should be enriched and adjusted according to the situation of the comprehensive reform of the course. The overall optimization of the course website has been realized, and the contents of online laboratory, self-test questions and simulation questions have been added.

Effectiveness of Construction

According to the orientation of the school aiming at the cultivation of applied talents, the theoretical and practical teaching system of engineering quality cultivation is constructed. In order to meet the requirements of the cultivation of applied talents, the teaching contents are optimized and integrated, and the systematicness, scientificity, advancement and practicability of the curriculum content system are guaranteed. The course system of theory teaching, hardware experiment, simulation experiment, course design and network teaching has been formed. In recent years, the enrollment rate of postgraduate entrance examination for electronic information students has reached nearly 20% annually, and the employment rate has reached more than 99%, keeping in the forefront of schools. In the follow-up survey of graduates, the employer's overall satisfaction rate of comprehensive quality, professionalism and professional ability of graduates majoring in electronic information is over 96%. It generally reflects that graduates majoring in electronic information in our university are "quick to start and strong to stay." Graduates of electronic and Information Science in our university have won the general recognition and high appraisal of local employers with their diligent dedication, solid skills and skills, down-to-earth work style, simple professional attitude and solid performance, and won the respect of colleagues, as well as a good reputation for electronic and information specialty.

Conclusion

In order to meet the increasing demand of national economic and social development for high-quality and innovative talents, curriculum construction is gradually attracting the attention of colleges and universities. With the vigorous development of national science and technology industry, the social demand for electronic information talents has become very prominent. Many colleges and universities have set up electronic information specialty to adapt to the social development. However, how to highlight the curriculum construction in the specialty construction and establish a curriculum system adapted to the training objectives is of great practical significance for the research topic of meaning.

Based on the research and practice of the comprehensive reform and practice of digital electronic technology course in Undergraduate Electronic Information Specialty under the background of transformation, this paper will definitely make the teaching objectives of Applied Undergraduate Electronic information specialty clearer and the teaching effect further improved. Through
strengthening the connotation construction of curriculum system, practice links, teaching methods and teacher training, we can train more applied talents of electronic information specialty, promote the rapid development of electronic information specialty, and cultivate more qualified applied talents for the economic society. It also plays a leading and demonstration role in the curriculum construction of similar majors and other related majors.

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