

Exploration and Practice of “Curriculum Ideological and Political Education” in the Course of Circuit Principle

Xinhe Zhang

School of Electronic and Information Engineering, University of Science and Technology
Liaoning, Anshan 114051, China

Abstract

Focusing on the fundamental task of buliding morality and cultivating people, colleges and universities are vigorously carrying out the teaching reform of curriculum ideological and political education, enhancing the teaching and educational awareness of teachers in all courses, and exploring the construction of ideological and political education system. Taking the course of circuit principle as an example, this paper explores how to integrage ideological and political elements into the teaching of this course, realize the cirriculum goal of combining “knowledge transfer and value guidance”, and cultivate a number of pillars with excellent professional technology and high ideological and political level.

Keywords

Circuit principle; Curriculum ideological and political education; Reform in education.

1. Introduction

The course of ideological and political theory in colleges and universities is related to the fundamental problem of what kind of people to train, how to train people and for whom to train people. General Secretary Xi Jinping pointed out that classroom teaching should be well used as the main channel, ideological and political theory courses should be strengthened through improvement, and ideological and political education should be more friendly and targeted to meet the needs and expectations of students' growth and development [1].

"Circuit principle" is a professional basic course for electrical engineering and automation, electronic information engineering, communication engineering, automation, measurement, control and instrument, optoelectronic information science and engineering in our school. The purpose of the course is to cultivate students' solid circuit analysis ability through the study of basic circuit theory and circuit analysis methods [2]. The main contents of the course include circuit model and circuit law, analysis of resistance circuit and analysis of sinusoidal steady-state circuit; analysis of three-phase circuit; analysis of circuits with coupled inductors; time domain analysis and complex frequency domain analysis of dynamic circuit. The task of this course is to enable students to master the basic theory of circuits and the basic methods of analyzing and calculating circuits. Through relevant experiments, students can get the basic training of experimental skills, prepare the necessary theoretical knowledge for solving practical engineering problems and further studying electrical problems, and prepare the necessary circuit theoretical knowledge and analysis methods for the study of subsequent courses (analog electronic technology, digital electronic technology, etc.). Through the joint efforts of several generations, we have accumulated certain curriculum construction achievements and teaching experience. It is the historical mission of The Times to train high quality applied innovative talents in new engineering. "Circuit principle" is built under the background of application-oriented universities training innovative new engineering talents and universities actively promoting the new mode of "Internet +" talent training. Through years

of teaching practice and exploration, the "Circuit Principle" course team has deeply realized the necessity of teaching reform in the intelligent era as a basic course for electrical engineering majors in colleges and universities.

2. Course Objective

The course is developed with the following objectives [3]:

- 1) Knowledge objective: Master basic concepts, theorems and laws of circuits, be able to analyze DC, AC steady-state circuits and dynamic circuits using circuit analysis methods, and store circuit theoretical knowledge for subsequent courses;
- 2) Ability Objective: Skilled in using instruments for experimental operation, be able to independently analyze and solve practical problems in circuits, develop rigorous scientific style and practical ability to solve complex problems;
- 3) Quality objective: To cultivate students' independent learning ability, honest learning attitude, positive innovation consciousness, and establish correct world outlook on life and values.

The teaching of this course is designed along three main lines: First, theoretical teaching realizes the goal of knowledge and integrates the viewpoint of moral education related to teaching knowledge; The second is to realize the goal of practical teaching and improve the ability of operation and scientific analysis combined with experiments; The third is to achieve the quality goal in the teaching process, and cultivate students' serious and responsible character with a rigorous working attitude, so as to improve their comprehensive quality. In the teaching process, we should deeply explore the ideological and political elements contained in the curriculum itself and organically integrate with the theoretical and practical teaching of the curriculum.

3. Desig of Ideological and Political Elements of Circuit Principle

The course content involves a large number of basic theories, which are the results of many years of research by many famous scientists. A large number of Ideological and political elements can be excavated. In addition, the teaching content of the circuit principle course is closely related to the daily life of college students. The analysis and solution of the circuit in the course can find a large number of examples in daily life, and can also analyze the real truth of being a man and doing things, the embodiment of socialist core values, and the ideal and responsibility of realizing national rejuvenation.

The specific ideological and political elements are analyzed as follows:

Chapter 1: In the teaching of basic physical quantities of circuit, Ohm's law and Kirchhoff's law, the units of physical quantities and the names of laws are named after famous scientists such as Ampere, Volt, Watt, Joule, Ohm and Kirchhoff. Through the contribution of scientists to circuit theory, students are trained to establish a correct world outlook, encourage students to study hard and master the core technologies in key fields as soon as possible. The equivalent transformation of $Y - \Delta$ of resistance and the equivalent transformation of voltage source and current source show that the different connection modes of circuit (power supply) may be the same in essence. Cultivate students' thinking mode of "seeing the essence through the phenomenon" and see the impact of today's international form on China. It is good on the surface, but not really good.

Chapter 2: The branch current method, node voltage method, mesh current method, superposition theorem, Thevenin's theorem and Norton's theorem can be used for circuit analysis. On the one hand, the above methods can be used for circuit analysis, that is, there are many methods to solve the same problem, so as to tell students that there can be many solutions

to the problems encountered in life and cultivate students' divergent thinking; On the other hand, by analyzing the advantages and disadvantages of various methods, lead students to make a specific analysis of specific problems, and find out the most suitable method.

Chapter 3: When studying the active power, reactive power and apparent power of sinusoidal AC circuit, take the difference between ordinary household electricity bill and enterprise electricity bill (enterprises pay more electricity bills due to a large amount of reactive power in their electricity consumption) as an example to analyze why enterprises pay more electricity bills than they actually do, which actually causes a waste of a lot of resources, so as to remind students to save energy, protect the environment and Cherish every grain, reduce unnecessary waste, and be prepared for danger in times of peace.

Chapter 4: Introduce the knowledge of using electricity safely through specific examples in three-phase AC circuit, and non-standard operation causes safety production accidents. Tell students the importance of standardized operation of power work through specific examples. So as to cultivate students' safety awareness and normative awareness, cultivate students' serious, responsible and meticulous professional spirit, and improve students' professional quality.

Chapter 5: The simplest mutual inductance circuit is the series connection of two inductors. Through specific examples in life (two students learn to influence each other, which may play a good role or the opposite role), it leads to the phenomenon that the series connection of inductors enhances and weakens each other, so as to cultivate students' awareness of unity and cooperation.

Chapter 6: The law of circuit switching denotes that at the moment of circuit switching, the voltage at both ends of the capacitor does not change suddenly and the current on the inductor does not change suddenly. "Using the beauty of literary symmetry and memorizing the dual formula of electricity" provides students with a relatively intuitive way of thinking and method, guides students to discover and understand the symmetry and unity of the circuit, combines it with aesthetics in life, and improves the learning effect by stimulating students' interest in learning.

Chapter 7: From the time domain analysis of the circuit to the Laplace transformation for the complex frequency domain analysis of the circuit, the French mathematician Laplace proposed a tool to solve the problem, which transforms the differential equation in the time domain into the algebraic equation in the complex frequency domain. Laplace transformation greatly simplifies the calculation, and has been widely used in automatic control, circuit analysis and other fields. In order to warn students to be grateful and not forget to dig wells.

4. Implementation of Curriculum Ideological and Political Education

4.1. Refine the Ideological and Political Elements to Realized the Whole Process and All-round Education

Teachers should deeply explore the curriculum connotation of circuit principles, give full play to the ideological and political elements contained in the curriculum itself, and organically integrate them into classroom teaching, so as to play the role of turning spring breeze into rain and moistening things silently. The ingenious integration of Ideological and political elements into various theorems and laws, formula derivation, analysis and calculation and other knowledge in the course is not only a visual explanation of theorems and laws, but also an ideological and political education for students, which can kill two birds with one stone. The ideological and political course aims to achieve "full education, whole process education and all-round education", and cultivate applied senior professionals with excellent politics, excellent quality and solid professional knowledge. Therefore, while imparting professional

knowledge in the classroom, we should also excavate educational elements from the course content, so that students can always receive ideological and political education.

The course of Ideological and political education is an organic combination of professional knowledge and ideological and political education. The course of Ideological and political education is not a long speech, nor is it a mere word. We should not only adhere to the nature and standard of professional courses, but also put the cart before the horse. The introduction of moistening things silently and naturally is neither abrupt nor stiff; It is neither rigid nor reasonable. It can be realized by text, sound, video and other ways. Rational use of a variety of teaching methods and means to ensure the teaching effect. Interspersed with the stories of inspirational figures in just a few minutes, it not only enlivens the classroom atmosphere, but also expands students' horizons.

4.2. Improve Teachers' Cultural Cultivation and Ideological and Moral Level

The key to integrate the concept of curriculum thought and politics into the curriculum is to build a team of high-quality teachers. Teachers are the implementers of teaching. Teachers' professional ethics, professional theoretical knowledge and scientific outlook will imperceptibly become the ideological guidance of students. Teachers are not only the main body of teaching and educating people, but also the first responsible person of classroom teaching. Therefore, teachers should continue to study and improve their cultural cultivation and ideological and moral level, which is the premise and foundation of carrying out curriculum ideological and political education. Teachers' words and deeds will imperceptibly affect students. Therefore, teachers should set an example, not only have a rigorous and serious working attitude, but also have the optimistic spirit of loving the motherland and being willing to contribute. At the same time, teachers should also abide by professional ethics, strictly require students to abide by classroom discipline and care for students [2].

5. Achievements and Deficiencies

Through three years construction and implementation, the ideological and political course of circuit principle mainly adopts the methods of classroom discussion, case analysis, information media and so on. Always adhere to the central link of building morality and cultivating people, run ideological and political work through the whole process of education and teaching, and realize the whole process and all-round education. Through the effective connection between ideological and political cases and curriculum content, give play to the ideological and political education function of teaching resources, teaching methods, teaching evaluation and other means, stimulate the driving force of students and help cultivate high-quality skilled talents needed by the society.

The course of circuit principle has achieved certain results in Ideological and political education. The course has clear knowledge objectives, ability objectives and quality objectives. The course team has formed the teaching design and teaching cases of Ideological and political courses.

The main problems in the construction of this course are: first, how to integrate the ideological and political elements with the course content of circuit principle, endow the ideological and political education with fresh vitality, enrich the connotation of circuit principle course, excavate its educational value and expand its educational and teaching function. Second, the depth of Ideological and political elements of the curriculum is not enough, so we need to further improve the teaching design and overall planning. Establish a curriculum ideological and political system, fully construct complete curriculum ideological and political elements, and decompose them in different courses to avoid the overlap and omission of these ideological and political elements. Third, how to test the achievement of the goal of Ideological and political education.

6. Conclusion

We discuss the ideological and political construction of circuit principle course, and analyze the ideological and political elements in this paper. Teaching practice has proved that the integration of ideological and political elements into curriculum teaching can effectively achieve the teaching objectives of knowledge, ability and quality, achieve good teaching results, and it is an effective teaching mode in response to General Secretary Xi's guiding ideology of establishing morality and cultivating people.

References

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