

Ideological and Political Education Teaching Exploration for "Analog Electronic Technology and Application" Course

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Abstract

This paper expounds the necessity of carrying out ideological and political education in the course, defines the knowledge goal, ability goal and ideological and political goal of "analog electronic technology and application" course, probes into the specific measures of Ideological and political construction in analog electronic technology course, fully excavates the ideological and political elements in the course, and organically combines professional education with ideological and political education, So as to realize the ideological and political education into the whole process of teaching.

Keywords

Analog electronic technology; ideological and political education of curriculum; Moral education; Ideological and political elements; Explore.

1. Introduction

"Analog electronic technology and application" course is an important core course of electronic information engineering technology major. The function of the course is to enable students to have certain basic knowledge, basic skills and basic professional ability of analog electronic circuit analysis, design, production and debugging, improve students' professional quality, cultivate students' innovative consciousness, and prepare for the subsequent professional study. The course content is rich, including diode and its application circuit, triode and its amplifier circuit, application of integrated operational amplifier, signal generation circuit, power amplifier circuit and DC power supply circuit, etc; In teaching design, the teaching method of integration of theory and practice is generally adopted, which integrates teaching, experiment, training, learning and doing; Both the teaching content and the teaching process contain a large number of Ideological and political elements, such as the ideological and political elements of the sense of mission and social responsibility of the times, the ideological and political elements of dialectical thinking, the ideological and political elements of teamwork, and the ideological and political elements of rigorous scholarship. The application of Ideological and political elements in the process of classroom teaching, so as to imperceptibly affect the students' Outlook on life and values, and achieve the ideological and political education of "moistening things silently", which urgently needs our professional teachers to think, explore and practice. It is the responsibility of analog electronic technology teachers to do a good job in the top-level design of Ideological and political education, grasp the ideological and political elements, construct the ideological and political teaching resources of "analog electronic technology and application" course, combine the online and offline mixed ideological and political teaching of online open courses, and realize "three complete education".

2. Exploration and Practice of Ideological and Political Education in Curriculum

2.1. Objective Design of Curriculum Ideological and Political Education

The course of "Analog electronic technology and application" should practice the trinity teaching goal of "value shaping, ability training and knowledge transfer", adhere to the organic unity of morality, knowledge transfer, ability training and value guidance in curriculum teaching. That is, the teaching goal includes three parts: knowledge goal, ability goal and ideological and political goal, As shown in Figure 1.

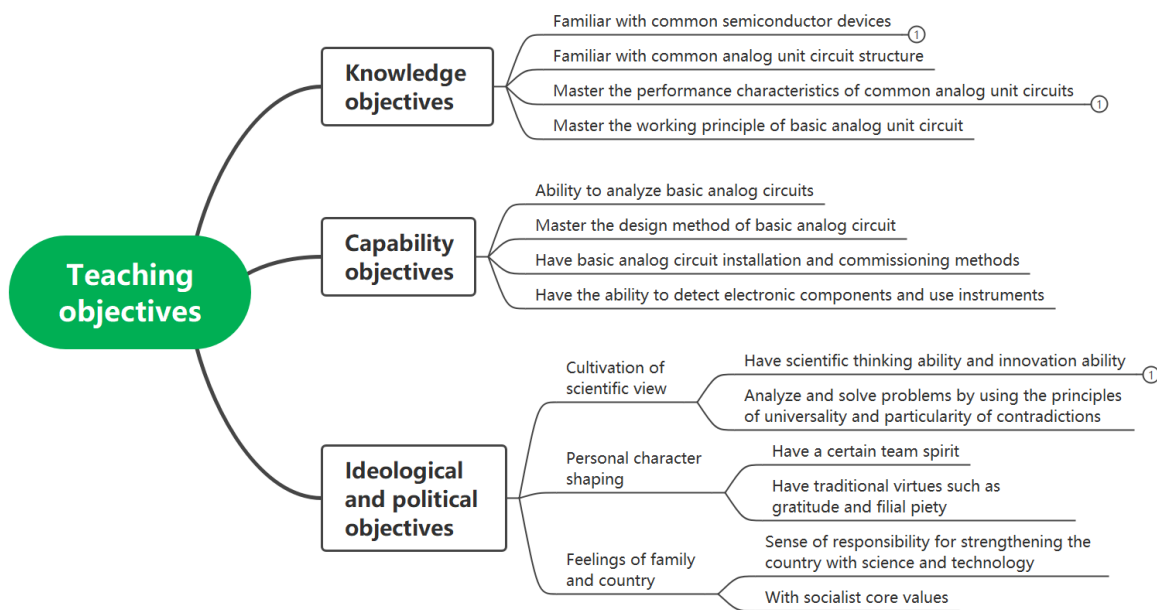


Figure 1. Teaching objectives of "Analog electronic technology and application"

The knowledge objective of the course is to understand the basic principles of common semiconductor devices (diodes, triodes and FET), master the characteristics and main parameters of these devices, master the methods of consulting manuals and correctly selecting common electronic devices, master the structure, working principle and performance of common basic unit circuits and typical circuits, master the methods of qualitative analysis and engineering estimation, and be able to select simple and applicable circuits as required, understand the basic structure, performance characteristics and applications of other common circuits.

The capability objective of the course is to be able to identify and detect common electronic components, and skillfully and correctly select electronic instruments to test their basic parameters, then determine the quality of components to adapt to the component procurement position of the enterprise. Be able to weld and assemble the circuit board according to the drawings, and have the ability to analyze and eliminate simple faults in the circuit, so as to adapt to the electronic product assembly post of the enterprise. The working principle of common unit electronic circuits will be analyzed to adapt to the electronic product debugging or product quality management position of the enterprise. Be able to design simple single function practical circuits according to requirements, and make practical circuits that meet the requirements through actual production, testing and modification, so as to adapt to the post of electronic product analysis and development.

2.2. Curriculum Ideological and Political Education Content Design

In order to achieve the ideological and political objectives of this course, the following ideological and political contents are designed:

(1) Stimulate students' patriotic enthusiasm through current events and hot spots. Carry out hot topic discussions on current affairs in the classroom, or use the discussion function of the high-quality online open course platform to carry out group task discussions, and bring the discussion posts into the scope of course assessment.

(2) Based on the characteristics and application of components, this paper expounds the development process of electronic technology, combined with the national conditions, that is, the development of intelligent technology and the importance of a big country, so as to cultivate students' feelings of home and country and stimulate students' patriotic enthusiasm.

(3) Through theoretical explanation and simulation, this paper combs the application of Marxist dialectics, social, natural and ecological norms in electronic circuit system.

(4) Combined with the wide application of electronic technology in China's life and science and technology, cultivate students' good qualities and social ethics such as independent thinking, unity and cooperation, responsibility and so on.

(5) Through time management, career planning, mind mapping and other learning tools and methods, students can master learning methods, continuously improve their ability to adapt to students' development, and form the habit of autonomous learning and lifelong learning.

(6) Combined with the circuit principle, advocate the awareness of energy conservation and environmental protection.

The course of analog electronic technology and application contains ideological and political elements everywhere. Take the triode amplifier circuit as an example to explore the combination of Ideological and political elements, as described below.

Course knowledge points 1: ideal triode

professional knowledge: Ideal model $u_{bq}=0V$, actual triode $u_{bq}=0.7V$ (silicon), $u_{bq}=0.2V$ (germanium).

Ideological and political integration point 1: Guide students to pay attention to the gap between ideal and reality, and cultivate social responsibility

Course knowledge points 2: Triode current amplification

professional knowledge: Internal and external factors shall be met, the internal cause is determined by the triode structure and material, and the external cause depends on the external bias.

Ideological and political integration point 2: In the process of life development, we should correctly treat the relationship between internal and external causes and dialectically treat opportunities

Course knowledge points 3: Triode amplifier circuit

professional knowledge: Emitter bias resistance r_e is conducive to the stability of static operating point, that is, the "advantage" of the circuit, but it will reduce the gain of the amplification circuit, that is, the "disadvantage" of the circuit.

Ideological and political integration point 3: Cultivation of Scientific Outlook: developing advantages and restraining disadvantages and making full use of everything.

Course knowledge points 4: Amplification circuit analysis method

professional knowledge: The analysis principle of "first static, then dynamic". The static operating point not only affects whether the circuit output is distorted, but also closely related to the dynamic parameters.

Ideological and political integration point 4: Dialectical thinking of mutual restriction and unity of opposites.

Course knowledge points 5: Negative feedback amplifier circuit

professional knowledge: Increasing the feedback depth can improve the performance of the amplifier circuit, but it is easy to produce self-excited oscillation.

Ideological and political integration point 5: Everything has one advantage and one disadvantage. Everything has a dialectical thinking of two sides.

Course knowledge points 6: AC and DC paths of amplifier circuit

professional knowledge: The DC power supply provides energy for the amplification circuit, and the triode can realize the amplification function.

Ideological and political integration point 6: All things in nature follow the law of conservation of energy and guide students to understand that the opportunity to receive higher education is the support and logistical support provided by our parents.

Course knowledge points 7: Partial voltage biased common emitter circuit

professional knowledge: The "piggyback" function of static operating point and the amplification demand of AC small signal.

Ideological and political integration point 7: Corresponding to the support of parents and the growth of children, guide students to be grateful to their parents and cultivate filial piety.

Course knowledge points 8: Effect of temperature on q-point

professional knowledge: When the temperature rises, the static working point moves up and enters the saturation region, the amplification circuit loses its amplification function.

Ideological and political integration point 8: The dialectical relationship between quantitative change and qualitative change guides students to "don't do it because of the small evil and don't not do it because of the small good".

2.3. Construction of Ideological and Political Teaching Resources

To implement the curriculum ideological and political education, one is to build teachers, that is, to cultivate professional teachers who are good at "three complete education"; The second is to build curriculum ideological and political teaching resources, including ideological and political teaching cases, teaching videos containing ideological and political elements, new forms of teaching materials for ideological and political education, etc. At present, 38 ideological and political teaching videos have been shot, with a total length of 294 minutes; Students have watched videos for about 300 hours this semester; The college level course Ideological and political demonstration textbook project has been applied for and approved. The first draft of the textbook has been completed and a publishing contract has been signed with the machinery industry publishing.

2.4. Design of Homework and Test after Ideological and Political Course

After class assignments completed by two or more people are added to reflect responsibility, unity and cooperation. In terms of homework content, ideological and political elements are integrated, such as the collection of historical science and technology stories, science and technology power stories, scientific and technological literature search and reading, home appliance maintenance and serving the people, etc.

2.5. Design of Curriculum Ideological and Political Assessment Scheme

In addition to Integrating Ideological and political education into classroom teaching, we should also realize ideological and political education in the process of after-school homework and assessment, so as to ensure that ideological and political education is integrated into the

whole process of teaching. The assessment scheme integrating ideological and political elements is designed as shown in Figure 2.

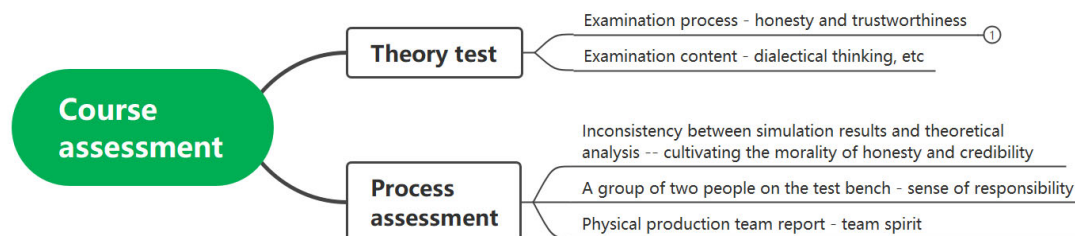


Figure 2. Design of assessment scheme integrating ideological and political elements

Taking the assessment of physical production process as an example, the whole class is divided into 6 groups, and one group leader is set in each group to assist the teacher in the distribution of components and materials, check the completion of projects in the group, take the lead in making and reporting PPT, etc. The project assessment results are divided into two parts: personal results and team results. Each student's personal results are 30% of the project production process, 30% of the commissioning results, 10% of the unity and mutual assistance and 30% of the team results (Group Report). The team leader is encouraged to improve his performance by 10% (limited to 100 points) after completing the task. Through the physical production teaching link, improve the students' spirit of unity and cooperation, and achieve the goal of Ideological and political education.

3. Effect of Ideological and Political Teaching

Through the course Ideological and political education, a good style of study has been established, which is reflected in the following aspects:

(1) The learning attitude is more correct and the learning enthusiasm is improved.

The class concentration is improved, the completion rate of homework after class is increased from about 90% before the implementation of Ideological and political education to 100%, and the completion rate of preview homework is increased from about 70% to 90%.

(2) Mutual discussion in the learning process and the spirit of mutual assistance have been carried forward.

The group discussion set up in classroom teaching makes it a habit to help, learn and evaluate each other, and reflects the evaluation of students' Ideological and political education through reward and bonus policies.

(3) The training link pays more attention to the "craftsman spirit" of "excellence".

Pay attention to details in the training process, such as abiding by the rules and regulations of the training room, emphasizing unity and cooperation, seeking truth from facts, precision and refinement, craftsman spirit, sorting and homing at the end of the training, improving students' habit cultivation and research spirit.

(4) Honesty and trustworthiness have become the recognized moral bottom line of students.

In the past, some students always looked around and wanted to see the answers of other students. The training link always depended on other students and enjoyed their success without hands-on operation. Through the development of Ideological and political education and the improvement of assessment scheme, the situation of cheating in examination has

improved significantly; During the training session, the students' enthusiasm has improved, and the situation of only seeing but not doing has long disappeared.

4. Concluding Remarks

The members of the course group of analog electronic technology and application have combined ideological and political education with the teaching content, deeply excavated the ideological and political elements contained in the course, and explored the method of embedding ideological and political education into classroom teaching, which not only cultivates students with solid circuit foundation, component knowledge and amplifier knowledge, but also focuses on cultivating students' autonomous learning ability and independent thinking The ability to analyze and solve problems, but also the ideological and political education throughout the whole course teaching, constantly stimulate students' interest in learning, explore new teaching methods, realize all-round education, and constantly improve the quality of applied talents.

Acknowledgments

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