

# ***Research on Integrating "Machine Tool Electrical and PLC" into Ideological and Political Teaching of the Course***

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**Abstract:** Based on the research on ideological and political education in the course "Machine Tool Electrical and PLC", this article explores how to integrate ideological and political education into the machine tool electrical and PLC course. By analyzing the characteristics of the course "Machine Tool Electrical and PLC" and the advantages of integrating it into ideological and political education, corresponding improvement measures are proposed to provide useful reference for higher education teaching practice.

## **1. Introduction**

With the continuous evolution and development of educational and teaching concepts, higher education focuses on cultivating students' comprehensive qualities and abilities, integrating moral education, intellectual education, physical education, and aesthetic education into curriculum teaching, and promoting students' comprehensive growth. As a professional course, "Machine Tool Electrical and PLC" not only cultivates students' practical operating skills, but also emphasizes the cultivation of students' ideological and political literacy, guiding them to form correct worldviews, outlooks on life, and values. Therefore, how to integrate ideological and political education into the course of "Machine Tool Electrical and PLC" has become a research hotspot in current higher education teaching reform.

## **2. Characteristics of the Course "Machine Tool Electrical and PLC"**

### **2.1. Strong practicality**

This course emphasizes the cultivation of students' practical operational abilities, including the installation, debugging, maintenance, and other practical operations of machine tool electrical equipment, as well as the programming and application of PLC. Students need to master the electrical and PLC knowledge in the course through practical operation, and have strong practicality. The course design emphasizes practical application, and students need to apply the knowledge they have learned in practical projects to solve problems and cultivate practical application abilities.

## **2.2. Strong comprehensiveness**

This course involves multiple disciplinary fields, including electrical engineering, automatic control, mechanical manufacturing, etc., requiring students to comprehensively apply multidisciplinary knowledge to solve practical problems.[1] The course content includes knowledge from multiple disciplines such as electrical, electronic, and automatic control, requiring students to have the ability to apply interdisciplinary knowledge comprehensively and cultivate their comprehensive literacy.

## **2.3. Fast technological updates**

With the continuous development of technology, the electrical and PLC technologies of machine tools are also constantly being updated. The course content needs to be constantly updated and adjusted to adapt to new technologies and demands in practical applications. Students need to have the ability to continuously learn and update knowledge, cultivate their ability to learn independently and innovate continuously.

## **2.4. High safety requirements**

Machine tool electrical and PLC involve high-voltage electrical equipment and high-risk mechanical equipment, and safety awareness and safety operation ability are important requirements of this course. Students need to have a rigorous safety awareness, be able to use electrical and PLC equipment correctly, and prevent potential safety risks. The course design focuses on safe operation and accident prevention, cultivating students' safety awareness and ability to cope with risks.[2]

## **2.5. Strong practical applicability**

This course focuses on cultivating students' practical application abilities, enabling them to apply the knowledge they have learned to solve practical problems in practical engineering projects. The course content and cases are usually closely related to practical applications, and students need to have the ability to translate theoretical knowledge into practical applications. The course design emphasizes practical application and problem-solving, cultivating students' practical operation and problem-solving abilities.

## **3. Advantages of Integrating Machine Tool Electrical and PLC into Ideological and Political Education in the Course**

### **3.1. Cultivate students' awareness of social responsibility**

By integrating ideological and political education into the course "Machine Tool Electrical and PLC", students can be guided to recognize their social responsibility as engineering technicians. The application of engineering technology is not only a technical issue, but also a comprehensive issue involving various aspects such as society, environment, and humanities. In the course, students will not only focus on the implementation and application of technology, but also delve into the impact of engineering technology on society and the environment, such as resource utilization, environmental protection, and humanistic care. This helps to cultivate students' awareness of social responsibility, enabling them to pay more attention to the balance between technology application and social responsibility in their future work, thereby better serving the needs of society and the people.[3] Through the guidance of ideological and political education in the course, students will understand

that engineering technology is not only a technology, but also a social responsibility. This will cultivate their in-depth thinking and comprehensive literacy on social, environmental, and humanistic issues, laying a solid foundation for their future career.

### **3.2. Enhancing students' comprehensive literacy**

The integration of the course "Machine Tool Electrical and PLC" into ideological and political education helps students form comprehensive quality education and cultivate their comprehensive literacy. In the course, by guiding students to deeply reflect on the relationship between technology application and society, culture, ethics, and other aspects, it helps students broaden their horizons and recognize that technology application is not only a technical issue, but also a comprehensive problem involving society, culture, ethics, and other aspects. Course ideological and political education can guide students to deeply reflect on the connection between technical issues involved in the course and society, culture, ethics, etc., and cultivate students' humanistic, social, and innovative qualities. Through case analysis, discussion, and interaction in the course, students can better understand and apply the technical knowledge in the course, and consider the influence of social and humanistic factors in practical applications. This helps students form comprehensive quality education, enhance their comprehensive literacy, and cultivate their thinking, judgment, and problem-solving abilities when facing complex problems.

### **3.3. Strengthen students' professional ethics**

Through ideological and political education courses, students can recognize the important issues of ethics, safety, and environmental protection in the application of engineering technology. These issues are not only related to technical aspects, but also involve comprehensive considerations of society, environment, and humanities. Course ideological and political education can guide students to think about the importance of professional ethics in the application of engineering technology, and cultivate their ability to follow professional ethics norms in practical applications through case analysis, discussion, role-playing, and other methods. In the course, students can learn about relevant professional ethics standards, professional ethics, and professional responsibilities, form correct professional ethics concepts, and be able to apply these concepts in their future career, follow professional ethics standards, achieve honesty and trustworthiness, diligence, confidentiality, care for the environment, etc., thereby cultivating students' professional ethics literacy and making them engineering and technical talents with high professional ethics awareness.

### **3.4. Improving students' comprehensive application abilities**

It can help students better integrate technical knowledge with social, humanistic, ethical and other knowledge, thereby cultivating their comprehensive application abilities. The ideological and political education course guides students to recognize that technology application is not just a technical issue, but a comprehensive issue closely related to society, environment, culture, and other aspects. In the course, students delve into the relationship between technology application and social, humanistic, ethical, and other aspects through case analysis, discussion, and practice, and master the methods and skills of applying technical knowledge to practical situations. The ideological and political education curriculum also focuses on cultivating students' innovative awareness and practical ability, encouraging them to carry out innovative design and practice in the curriculum, exercising their ability to solve practical problems, and cultivating their comprehensive application ability, so that they can fully play the role of professional technology in practical work, while taking into account social, humanistic, ethical and other factors, To lay a solid foundation for better handling

various complex situations and problems in future engineering and technical work.

### **3.5. Enhancing students' interdisciplinary abilities**

The integration of ideological and political education in the course "Machine Tool Electrical and PLC" not only focuses on imparting technical knowledge, but also guides students to think across disciplines. Through the guidance of ideological and political education in the curriculum, students can realize that the application of engineering technology is not isolated, but closely related to disciplines such as society, culture, and ethics. The course of ideological and political education encourages students to integrate engineering technology with other disciplines, and to delve into the intersection and interrelationships between technology application and social, cultural, ethical, and other disciplines. In the course, students will be encouraged to think interdisciplinary and explore the interaction and influence of technology application with disciplines such as society, culture, and ethics. Students will learn to analyze and solve problems from different disciplinary perspectives, apply interdisciplinary knowledge and methods, and develop interdisciplinary comprehensive literacy. Through case studies, group discussions, practical projects, and other means, students will have the opportunity to apply the concepts and methods of different disciplines to practical engineering and technical problems, and cultivate their interdisciplinary research and innovation abilities.

## **4. Strategic Suggestions for Integrating "Machine Tool Electrical and PLC" into Ideological and Political Teaching in the Course**

### **4.1. The concept and objectives of introducing ideological and political education into the curriculum**

At the beginning of the course, the concept and objectives of ideological and political education can be introduced through course introduction and teaching plan, clarifying the connection between the course and disciplines such as society, culture, ethics, etc., and emphasizing the close connection between technical knowledge and social practice. Students can be introduced to relevant social issues and the social impact of technology application, which can stimulate their interest and thinking on social, cultural, ethical and other issues.

### **4.2. Design ideological and political teaching content that conforms to the characteristics of the course**

The course "Machine Tool Electrical and PLC" can guide students to deeply reflect on the status, role, and impact of technology application in society through case analysis, discussion, role-playing, practical projects, and other forms, involving various social, cultural, ethical and other issues. For example, case studies can be used to discuss the conflicts of interest, ethical dilemmas, and social impacts of certain machine tool electrical and PLC applications in society, guiding students to engage in moral thinking and value judgments; Through practical project design, students can consider sustainable development issues such as environmental protection and resource utilization in practical operations, and cultivate their sense of social responsibility and innovation ability.

### **4.3. Provide diverse learning resources**

Curriculum ideological and political education can utilize diverse learning resources, including literature, reports, speeches, videos, news, etc., to guide students to understand and understand the knowledge and perspectives of different disciplines. For example, it can guide students to read classic

literature and research results in social, cultural, ethical and other disciplines related to machine tool electrical and PLC, and conduct literature reviews and academic discussions; Organize students to give group reports or speeches, allowing them to explore social issues related to machine tool electrical and PLC from different disciplinary perspectives, and demonstrate their interdisciplinary research and expression abilities; Through the introduction of actual cases and news reports, students can understand and discuss social hot issues related to machine tool electrical and PLC applications, promote students to think and analyze problems from multiple perspectives, and cultivate their critical thinking and comprehensive literacy.

#### **4.4. Cultivate students' innovation ability**

Curriculum ideological and political education can cultivate students' innovative abilities by guiding them to conduct research projects and design projects. For example, students can be organized to conduct research projects, explore social issues related to machine tool electrical and PLC applications, and stimulate their innovative thinking and creativity; It can guide students to design practical projects, allowing them to consider social, cultural, ethical and other factors while applying technology, and cultivating students' practical and comprehensive application abilities.

#### **4.5. Emphasize teamwork and practical abilities**

Course ideological and political education can cultivate students' teamwork and practical abilities by organizing team cooperation and practical activities. For example, students can be grouped for group discussions, experiments, project design, etc. to guide them to collaborate and solve problems together; Students can be organized to participate in practical social research and practical activities, allowing them to personally experience and experience social phenomena and problems, and improving their practical operation and application abilities.

#### **4.6. The Transformation of Teacher's Role**

In the teaching of ideological and political education in the curriculum, teachers need to transform from traditional knowledge imparters to guides and promoters for students. Teachers can stimulate students' interest and enthusiasm in learning by guiding them to actively participate in classroom discussions, raise questions, conduct research, and innovate; Through interaction and discussion with students, students can be guided to think and delve deeply into social issues related to the curriculum, leading them to form independent and critical thinking; Encouraging students to express and respect different perspectives can promote their multicultural awareness and inclusive thinking.

#### **4.7. Innovation in evaluation methods**

The ideological and political education curriculum needs to adopt innovative evaluation methods, shifting from simple knowledge assessment to comprehensive literacy and innovative ability evaluation. Classroom discussions, reports, group projects, practical reports, academic papers, and other methods can be used to evaluate students' comprehensive and innovative abilities in ideological and political education. At the same time, the evaluation method should focus on students' process evaluation, pay attention to their learning attitude, participation, teamwork ability, and other aspects, encourage students to actively participate in ideological and political teaching activities of the course, and form a feedback mechanism to guide students to improve and enhance in a timely manner.

#### 4.8. Diversified resource utilization

Curriculum ideological and political education should fully utilize diverse resources, including books, articles, cases, news, actual projects, social research, etc. Teachers can guide students to read and analyze relevant literature, guide students to obtain real-time social information and data through the Internet, guide students to participate in practical projects and social research, provide practical opportunities and platforms, enrich students' learning resources and experiences, and promote students to deeply understand and think about social issues related to machine tool electrical and PLC applications.

#### 5. Conclusion

Curriculum ideological and political education is an effective way in today's higher education, which can cultivate students' ideological and moral concepts, social responsibility awareness, and innovative spirit. Integrating the course "Machine Tool Electrical and PLC" into ideological and political education can achieve good results in promoting students' ideological and political education and comprehensive literacy cultivation, helping them better understand and apply the course content, and enhancing their comprehensive quality and sense of social responsibility. This has a positive promoting effect on cultivating high-quality and socially responsible talents. Future research should further deepen the theoretical research of ideological and political education in courses, enrich the implementation strategies and methods of ideological and political education, promote the widespread application of ideological and political education in technical education, and provide better teaching guarantees and support for cultivating high-quality technical talents with comprehensive development of morality, intelligence, physical fitness, aesthetics, and labor.

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