

The Teaching Design and Practice of Integrating Ideological and Political Elements for Principle of Automatic Control Course

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Abstract: Mainly around the course construction of "Automatic Control principle" in the automation major of Liaoning University of Science and Technology, the ideological and political requirements of the course, and combined with the actual course teaching content, deeply dig the ideological and political points of the course, and designed. Through the integration point and practice of ideological and political education, teaching methods and carrier teaching design and practice, we can give full play to the educational function of professional courses.

1. Introduction

At the National Conference on Ideological and Political Work in Colleges and Universities, General Secretary Xi Jinping pointed out that we should make full use of classroom teaching as the main channel, and organically combine knowledge education with ideal and faith education and moral education to form a synergistic effect. We should integrate professional courses with ideological and political education, and integrate ideological and political education into the whole process of professional courses teaching, give full play to the ideological education and value leading role of professional courses, promote the healthy development of students in an all-round way, and take "moral education" as the central link of teaching and the fundamental task of education[1]. The Principles of Automatic Control is a professional basic required core course in automation, measurement and control, robotics, electronics and electrical engineering and its automation majors. This article focuses on the main line of learning ideological and political elements and knowledge points, the students' outlook on life, values and behavior and many other aspects of the spring breeze, silent infiltration and subtle influence[2].

2. The teaching objectives of ideological and politics

The quality of talent training in colleges and universities directly affects the quality of higher education, and the main channel of talent training lies in the classroom. The Principles of Automatic Control course fully excavates the resources and elements of ideological and political education, and

integrates it into the professional course teaching, from the reform and practice, subtly realize the ideological and political education for students, cultivate the scientific spirit and innovative spirit, and cultivate students to be pragmatic. The spirit of excellence; train students to be hard-working and pursue excellence.

3. Curriculum ideological and political elements and integration points

According to the teaching objectives and education objectives, the teacher has deeply excavated and designed the teaching content of the Principles of Automatic Control, designed 16 ideological and political points, covering almost every section, and has realized the ideological and political education. The integration points of the specific design are shown in Table 1.

Table 1: Automatic Control Principles Course content and ideological and political integration points.

order number	course content	Ideological and political content
1	1.1The History of automatic control in the Introduction 1.2Basic way of automatic control 1.3Composition of the control system	1.The Father of automation-Qian Xuesen, patriotism. 2.Guide students to carry forward positive energy with the help of positive feedback control such as hanging beam thorn stock and prime minister belly boat story. 3.Through the interconnection and mutual restriction of each component, the relationship between the whole and the parts is introduced, and students are taught to abide by their functions, unite and cooperate in the spirit of unity and cooperation.
2	2.1Mathematical model of the control system 2.2The structure is modeled and simplified	4. Use the high abstraction and generalization of mathematical models to educate students to recognize the essence and extend to self-knowledge. 5. Through a series of simplifications, educate students to overcome difficulties and strive for their own life goals.
3	3.1Time-domain analysis of the first-order systems 3.2Time-domain analysis of the second-order systems 3.3System stability analysis 3.4Analysis and calculation of steady-state errors	6. Through the first-order system response, students can realize that with setbacks, they should change their "inherent attributes" with a positive attitude. 7. Through the first-order system response, educate students to solve problems and grasp the principal contradiction and find the leading factors. 8. The significance of the stability of the control system, and then extend the national stability, national unity, campus stability. 9. Through the calculation of steady-state error, guide students to improve in their future study and work, otherwise it will be "poor, lost a thousand miles". 10. Teaching the basic requirements of control system comprehensive evaluation of the system, extending the relationship between principal and secondary contradictions.
4	4.1Basic rules for drawing the root tracks 4.2The performance of the system was analyzed using the root traces 4.3The time domain of higher order	11. Teach students to abide by the law by drawing the basic laws. 12. Analyze the system performance through the root trajectory map, and map us to solve the key points and the main factors. 13. Through descending treatment, provides a new thinking and method, when the problem is not easy to solve, might as well relax some conditions, endure a

	systems is accordingly		calm, take a step back, education students to overcome difficulties, everything can be solved.
5	5.1Open-loop frequency characteristics of the system		14. When teaching the system impact of low, medium, and high frequency bands in the frequency domain, each stage of life has different missions and different goals.
	5.2Stability margin in the frequency stability criterion		15. By teaching the meaning of stable margin, using the saying goes, "when soldiers and horses move, food and grass go first", be fully prepared.
6	1.Correction of the control system		16. By explaining the design and correction method of linear system, and by borrowing the old Chinese saying "don't look for three days, when sit up and take notice" to guide students to look at problems from the perspective of development.Carry forward the good fashion of lifelong learning of the old generation, keep pace with The Times, and always have advanced ideas and high professional quality.

4. Curriculum ideological and political implementation measures and effectiveness

Through the introduction and organize students to watch the father of automation-qian xuesheng, guide students to carry forward the hard study spirit, overcome difficulties spirit, innovation spirit, unyielding spirit and the motherland strong and dedication of patriotism, motivate students to realize the great rejuvenation of the Chinese nation to realize the great Chinese dream, realize their life value. Watching Qian Xuesen's video online, students were asked to give feedback in the discussion area by means of bullet screen and messages, and submit their comments. Teachers integrated the content, and provided data and experience support for the subsequent research.

The 2021 fall semester coincides with the 100th anniversary of the founding of the Communist Party of China. Zhou Zhenchao taught red songs before the 100th anniversary of the founding of the Party. The teaching supervision group of Liaoning University of Science and Technology commented on Zhou: "Zhou Zhenchao of Telecom's robot BG191 / 192" Automatic Control principle "course, Zhou organized students to sing" No Communist Party, 5 minutes before no new China ". The ideological and political content of this semester course is arranged to sing red songs. The first song of the semester is "March of the Volunteers". Now singing "No Communist Party, no New China", students can not sing. Teacher Zhou personally downloaded it from the Internet and taught students to sing. Mr.Zhou always has some new ideas in teaching. Complete teaching documents, skilled content, fluent language, concise and comprehensive, highlight the key points."

5. Conclusion

Ideological and political course is the whole process of teaching and educating people. The author applies the ideological and political elements designed to the actual teaching in the past two years, so that students can truly establish the correct outlook on life, values and behavior while mastering the professional courses. Compared with previous students, students' spiritual outlook and ideological quality have been significantly improved, which improves the quality of talent training under the new engineering background. At the same time, the performance of the automatic control principle course has also been greatly improved. In terms of curriculum construction, it has also been recognized by the school, and won the first-class offline courses and curriculum ideological and political demonstration courses, and has achieved effective experience and practical results. At the same time, it plays a certain demonstration role in the construction of similar colleges and related majors, and has

a positive impact on the industry and place. The social recognition of the majors is improved, which is conducive to the employment of students. The ideological and political education of automatic Control principle of Liaoning University of Science and Technology has formed a replicable teaching reform experience, which is worth learning from.

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References

- [1] Wang Xianlei et al. "Automatic Control principle" course discussion [J]. *Education and Teaching Forum*, 2020 (6): 55-56.
- [2] Li Yuejuan et al. Curriculum for Ideological and Political Education Research in the "Principles of Automatic Control" course [J]. *Education and Teaching Forum*, 2021 (9): 29-32.
- [3] Xiao Liqing. Ideological and political Construction of the course of Principles of Automatic Control based on Line Generation Information Technology [J]. *Journal of Suihua University*, 2021 (2): 132-135.
- [4] Du Hui et al. The Ideological and Political Design and Research of the Automatic Control Principles Course [J]. *Guangdong Chemical Industry*, 2021 (12): 280-281.
- [5] Gao Qiang et al. Exploration and Practice of Ideological and Political Content Construction-Taking the Automatic Control principle of Tianjin University of Technology as an example [J]. *Light Industry Education in China*, 2021 (4): 7-10.
- [6] Zang Qiang et al. Exploration and Practice of Curriculum Ideological and Political Integration into Engineering Education Professional Certification-Taking "Automatic Control Principles" as an example [J]. *Science and Technology Information*, 2021 (14): 162-164.