

Research on the Internationalization of Undergraduate Courses in Electronic Drive and Control

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Abstract: With the acceleration of globalization, internationalization of education has become an important direction for higher education reform. In the field of engineering technology, electronic drive and control is one of the core courses, and its internationalization reform is of great significance for cultivating engineering and technical talents with international perspectives and innovative abilities. Electronic drive and control technology is an important component of modern engineering technology, widely used in fields such as automation, robotics, and new energy vehicles. With the development of technology and the integration of the global economy, higher requirements have been put forward for professionals in the field of electronic drive and control, especially in terms of international perspective, cross-cultural communication ability, and innovative thinking. Therefore, the internationalization reform of undergraduate courses in electronic drive and control is particularly urgent. This article aims to explore the current situation, challenges, and future development directions of the internationalization of undergraduate courses in electronic drive and control, providing reference and suggestions for curriculum reform.

Keywords: Internationalization of Education; Internationalization of Curriculum; Higher Education; Curriculum Reform

1 Introduction

The theoretical development of electronic drive and control discipline is closely related to national strategies such as education reform under the background of "new engineering".

China Education Modernization 2035 proposes the basic concepts, main goals, and ten major development strategies for future education development, with internationalization of education being one of its strategic tasks. The world urgently needs a large number of international talents today. Higher education is no longer limited to a single school, region, or country, it has developed completely globalized. In the context of international education, it is necessary to cultivate talents with an international perspective. Cultivating innovative engineering talents with an international perspective is not only necessary to adapt to the internationalization of higher education, but also to enhance the comprehensive strength of higher education institutions themselves. Therefore, from the perspective of internationalization of undergraduate courses, accelerating the construction of new engineering disciplines and reforming talent training models is the trend. [1-4]

2 The Current Development Status of Electronic Drive and Control Courses

Electronic Drive and Control uses all English teaching tasks, and has discussed teaching content, modes, and assessment methods with Daniil Yurchenko, the relevant course manager at the University of Southampton in the UK. A comprehensive teaching material has been prepared, forming a teaching mode that covers three parts: pre class, in class, and post class. The course also participated in the National University of Singapore STEM Teaching Ability Enhancement Online Training Program, integrating advanced teaching concepts and methods into the course. In addition, the teaching team has rich teaching experience, teaching reform, and international exchange experience. The teaching team is able to try new teaching concepts in practice, enhance the

internationalization of the curriculum, and is gradually promoting it to the teaching of other courses. Through the internationalization teaching and practice of the course "Electronic Drive and Control", although some progress has been made, the internationalization reform of the undergraduate course "Electronic Drive and Control" still faces some problems.

3 Problems Faced

3.1 The Foreign Language Proficiency of Students

According to course practice, it has been found that the professional English level and oral communication ability of students are generally weak links for undergraduate students, and they are also urgent problems that need to be solved in international learning of the course. Although there are also English courses taught during undergraduate studies, students are not familiar with their professional English and some proprietary terms are not accessible in English courses. In international courses taught entirely in English, students may encounter sudden exposure to professional terminology and vocabulary, which makes it difficult for them to understand the content taught by the teacher.

3.2 A Interdisciplinary And Integrated Curriculum System

Real-world problems are rarely defined within narrow disciplinary boundaries, and undergraduate students should benefit from the interactions between disciplines hidden within these problems. Interdisciplinary teaching can benefit students in terms of learning motivation, quality and confidence cultivation. Therefore, the professional curriculum fully reflects the characteristics of the profession, carries out high-level and distinctive teaching content, and introduces the latest research results into teaching, emphasizing the coherence of the curriculum, and achieving integration and coherence

3.3 Students Have Weak International Perspectives

The current internationalization challenge lies in the weak international perspective of local teachers and students, and international courses are often understood to be taught in English. Students pay less attention to the

latest developments in domestic and international scientific research in this field, and the teaching content lacks updates. In addition, foreign teachers face communication barriers with students due to cultural and linguistic differences, resulting in limited and difficult classroom interactions. Students rarely engage in in-depth communication and discussion of course content with foreign teachers outside of class.

4 Reform Measures

4.1 Enhancing Student Adaptability

Students need to strengthen their learning of professional English. Teachers can provide several parts of learning materials for students to preview before teaching, during which they can systematically introduce the course overview, main English vocabulary, key points taught by foreign teachers, and preparatory knowledge to students. In order to improve students' understanding of professional terminology, different teaching methods can also be tried, including explanations, interactive learning, group discussions, online learning resources, etc.

4.2 Optimize Course Design

Based on the advantages and distinctive resources of our school in the fields of electronic engineering, control engineering, and electrical engineering, we will design curriculum teaching content with our school's unique characteristics, form an important component of the teaching system, effectively undertake the preceding courses, and lay a foundation for subsequent courses. Establish a multidisciplinary and integrated teaching team, carry out professional backbone and characteristic courses as well as international curriculum construction, and integrate the latest scientific research achievements to provide students with rich after-school learning resources and practical teaching cases. By analyzing the relationship between courses, this course is closely related to the previous courses "Electrical and Electronic Systems" and "Mathematics", and lays a theoretical foundation for the subsequent courses "Advanced Electrical Systems". The logical relationship between each course is shown in **Figure 1**.

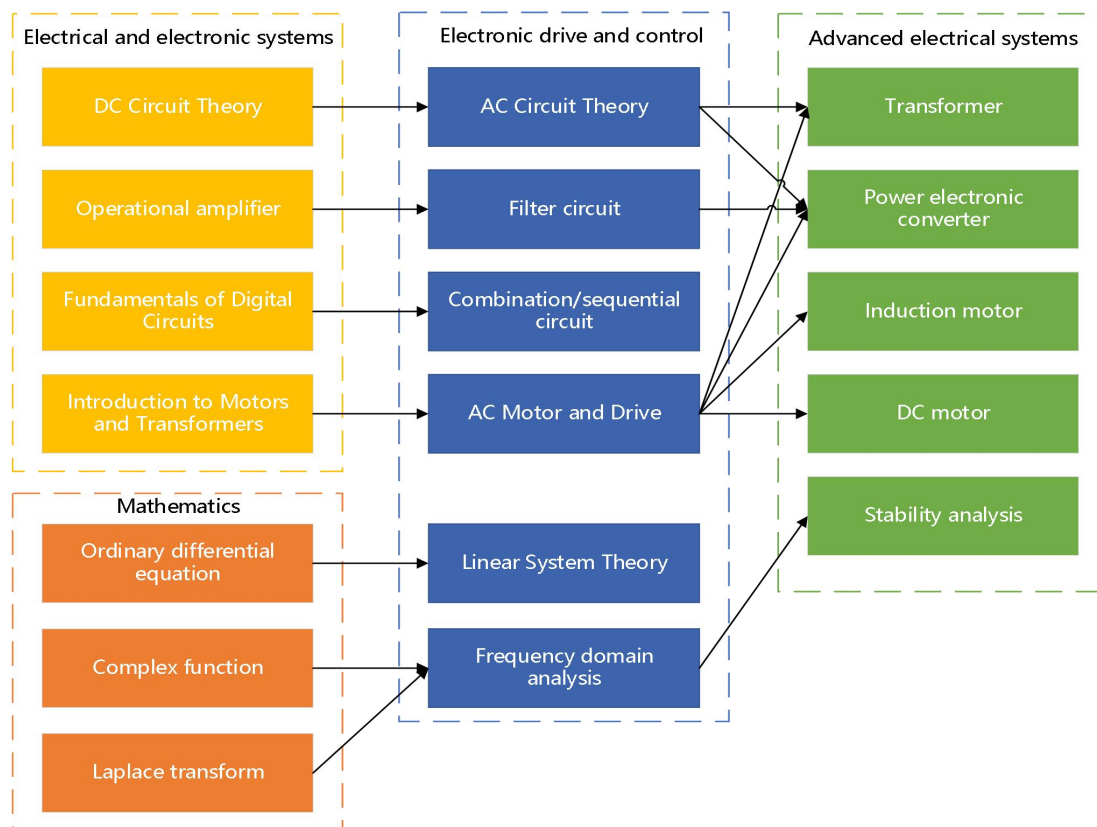


Figure 1: The logical Relationship of the Course

4.3 Developing Students' Comprehensive Abilities

Class design part: With the goal of stimulating students' learning motivation, build online learning resources and post class learning content with professional characteristics. MOOC learning is mainly aimed at acquiring new knowledge, and watching instructional videos is the initial self-construction of new knowledge. Provide students with classic and latest literature resources, enabling them to understand the cutting-edge development of the discipline and possess the ability for self-directed learning.

Research training section: Teachers guide students to understand the research environment, conduct comprehensive research training, and enable students to have a certain level of technological innovation thinking. Effectively carry out the discussion section of seminar classes, design project-based teaching seminars, cultivate students' ability to actively discover problems, consult literature, and solve problems, integrate scientific research with teaching content, and encourage students to conduct scientific research exploration within their abilities.

After class practice part: Based on the learning content of this course and the interests and strengths of students, encourage students to participate in school, provincial, and national level competitions, such as electronic design competitions, intelligent vehicle competitions, etc., integrate the course learning content into after class practice, rely on innovation and entrepreneurship topics, and produce rich innovative results.

5 Conclusion

The implementation of international curriculum construction is aimed at cultivating world-class international high-quality talents. This article takes the electronic driving and control of undergraduate courses as an example to deeply analyze the problems existing in the international teaching of this course and propose corresponding reform measures. In teaching practice, improving the curriculum system, establishing a long-term international education cooperation platform, promoting the development of students' abilities, integrating advanced concepts of national future education, and keeping up with the global development needs of the intelligent era, we still need to continue to work hard to

create a high-level and high-quality educational environment.

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