

Discussion on the Teaching and Practice of Embedded System Design Course for Applied Undergraduate UAV Major

Manman Du*

School of West Yunnan University, Lincang 677000, China

*kuailedexiaoman@126.com

Abstract

With the rapid development of UAV technology, how to cultivate high-quality UAV professional and technical talents in applied undergraduate education has become the focus of the current education field. This project will analyze and discuss the teaching improvement scheme of embedded system curriculum from the perspectives of teaching content, teaching methods and practical teaching links, and put forward the course design method driven by real enterprise projects. Therefore, from the reality, students can apply what they have learned, stimulate students' learning enthusiasm and improve the teaching efficiency. Design more interactive, intelligent and personalized teaching methods and technologies, including inquiry, discussion, participatory teaching and mixed learning methods and technologies based on information technology.

Keywords

UAV Education; Embedded System; Curriculum Design and Teaching Method.

1. Introduction

This paper aims to explore the teaching and practice of embedded system design courses in applied undergraduate UAV majors. With the rapid development of UAV technology, embedded system design, as one of the important disciplines in the field of UAV, is of great significance for the cultivation of students' comprehensive ability. How to effectively introduce practical teaching and cultivate students' practical ability and innovative thinking is one of the focal points of this paper. Secondly, this paper will explore the optimization of curriculum setting and teaching methods to meet the current needs of the UAV industry, so that students can be qualified for related jobs after graduation. Finally, this paper will summarize the effect of practical teaching and the improvement of teaching methods, in order to provide reference for the teaching practice of the embedded system design course of the applied undergraduate UAV major.

2. Current Status of Applied Undergraduate UAV Professional Education

2.1. Teaching Objectives of Applied Undergraduate UAV Major

Applied undergraduate university drones professional talent training target for UAV applications, follow the trend of drone technology development, cultivating morality, intelligence and physique, beauty, comprehensive development, familiar with drone industry standards, master the basic theoretical knowledge and professional skills, with UAV related product development, system integration, debugging, maintenance and innovative application engineering ability, engaged in all kinds of drone industry research, development, production, control and maintenance service work of applied professional and technical personnel.

2.2. Problem Analysis of the Embedded System Design Course of UAV Major

Due to the late development of the embedded system in China and the explosive development in recent years, the embedded system teaching has not formed the optimal teaching model and has the following problems:

- (1) Curriculum theory. The course focuses on theoretical teaching. In the process of dozens of credit hours, it is difficult for students to fully master and understand the professional knowledge points, and it is even more difficult to understand the practical application.
- (2) Experimental teaching resources are insufficient. The lack of experimental technicians, the student experimental group is too large, such as 4 ~ 5 groups, can not ensure that each student hands-on operation, the teaching effect is greatly reduced.
- (3) Students do not pay enough attention to the experimental course, some students have no interest in the experiment, there is the phenomenon of random absence, the current assessment method is not perfect lead to most students to deal with the experimental course [1].
- (4) Most of the classroom experiments belong to demonstrative and verification experiments, which lack comprehensive and designed experiments.

3. Curriculum Reform Measures

3.1. Content of Courses

Students' understanding of the first course is not the same, and the level is uneven. How to stimulate students' interest in learning, improve hands-on practice, ability, cultivation of engineering innovation ability and innovative spirit is the process of talent training the key problem in the [2].

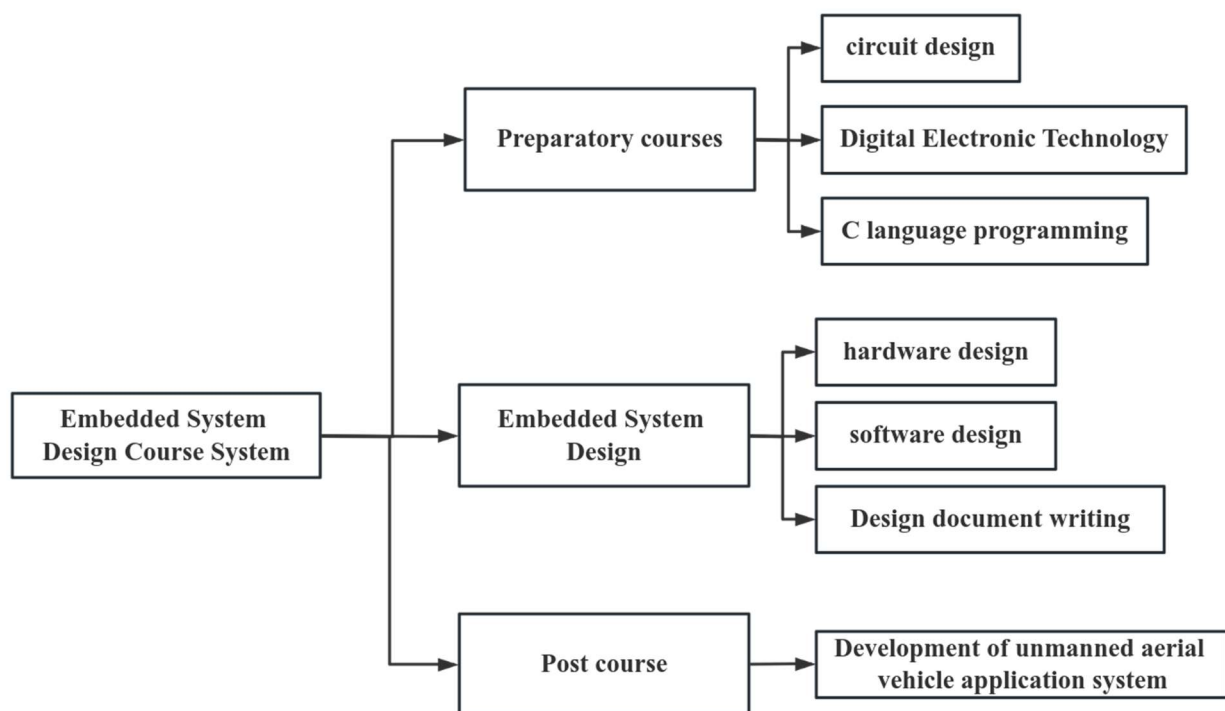


Fig.1 Embedded System Design Course System

Embedded system course is a course that closely combines theory and practical application. It covers a wide range of knowledge, with digital circuit, microcomputer principle, digital signal

processing and other courses as the early foundation, requires students not only to be familiar with the hardware design, the basic theory and algorithm of digital signal processing, but also to use assembly language, C / C++ language and other related tools for algorithm development and software design. Therefore, the embedded system design courses are taught after finishing the above basic courses. Although the interval time is not long, most students' basic knowledge of circuit analysis has been blurred, so it is very necessary to review. Students are required to review the relevant basic knowledge after class, and spare some time in class to lead the students to review, so as to lay a foundation for the application of the embedded system.

From the shallow to the deep, drawing inferences from one example, the key strengthening, embedded system knowledge points, need to prepare a variety of teaching materials before class, fully and comprehensively explain, and highlight the key points. To strengthen the practical engineering application of theoretical knowledge.

3.2. Teaching Methods

Theoretical teaching method specifically refers to the method of introducing the theoretical teaching content, and adopts the information, interactive and exploratory method for teaching. In the teaching process, students will encounter various problems, so they can establish learning groups through the information platform to solve their problems in time; discuss the study in a study group, without ignoring any student problems; and introduce the course content, allowing students to think with problems and conduct inquiry learning.

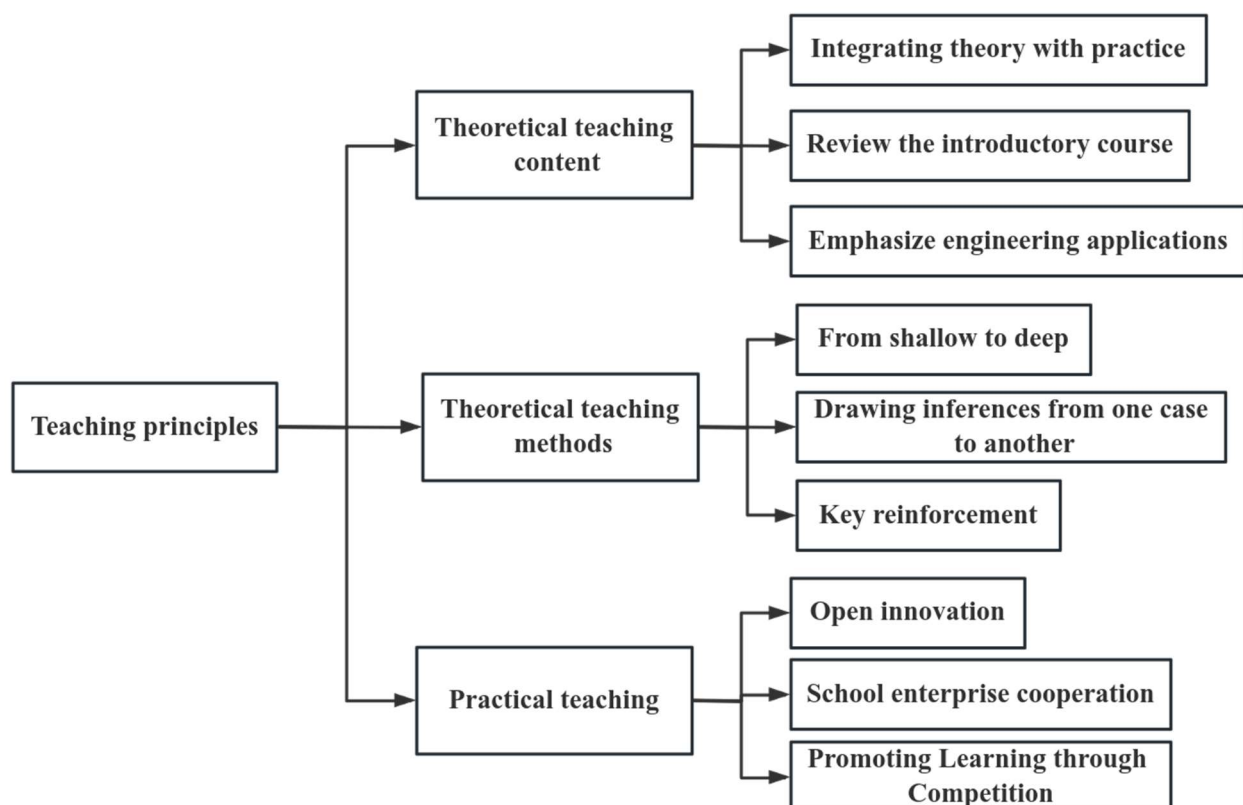


Fig.2 Teaching principles

3.3. Practical Teaching

Only the theoretical explanation, not enough attention to the practice. As a result, students have the feeling of "invisible and invisible" of the embedded system [3].

Practical teaching needs practical open and innovative experiments, school-enterprise cooperation, and the establishment of an ecological school-enterprise cooperation and education environment, based on production

The implementation of the embedded curriculum system of teaching integration provides policy guarantee. Continue to implement the course group teaching according to the stage, and formulate the course objectives.

Standard evaluation and assessment mechanism, dynamic cutting of industrial application technology class, to adapt to the latest needs of the industry development ^[4]. To promote learning through competition and cultivate students' interest in learning.

4. Conclusion

According to the educational policy of integrating industry and education in application-oriented undergraduate colleges and the characteristics of cultivating new engineering professionals, the reform plan of embedded system curriculum teaching is discussed from two aspects of theoretical teaching and practical teaching. This scheme advocates theory to promote practice, practice test theory, by optimizing the teaching content, improve the teaching method to the actual project development experience into the classroom, mobilize students' interest in learning embedded system, encourage students to participate in each level embedded system design competition, cultivate students' engineering comprehensive practice ability, finally realize the complex engineering problem solving process, basic teaching experiment cognitive process, subject professional talent interest and ability training process, realize the goal of compound, high-quality applied undergraduate talent training ^{[5][6]}.

Acknowledgements

West Yunnan University.

References

- [1] Luo Xia, Luo Kuo, Li Zhen, etc. Research and exploration of a large platform of professional innovation practice under the background of new engineering [J]. China's educational technology and equipment.2019.10: 126-128.
- [2] Xiaodong Zhang, Lu Ke, Li Xiujuan, "Embedded system" course teaching research [J]. Computer Education, 2011, (8): 76-79.
- [3] Li Ning, Song Wei, Ku Shaoping, project embedded teaching methods [J]. SCM and embedded system application, 2010,10 (2): 5-8.
- [4] Fang Gang, Wang Jiale: Research on the Construction of Embedded Applied Curriculum System Based on the Integration of industry and Education [J], Modern Computer,2018,10,53-54.
- [5] Yan Chaoyong, Ye Jianjun, Zhu Lutao. Research on the countermeasures to improve the experimental practice and innovation ability of teaching-oriented college engineering students [J]. Education and teaching forum.2013,(44).
- [6] Feng Yuan, Hai Pengbo, Wu Hongqi. Reform mode and exploration of power electronic technology experiment [J]. Journal of Higher Education, 2018 (9): 121-123.