

# Implementing the teaching reform of electrical and electronic & electronics technology course by combining online and offline

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**Abstract:** *Electrician and electronic & electronics technology is a very important professional basic course, With the rapid development of modern information technology in today's society, the current classroom teaching of electrician and electronic & electronics technology is facing great challenges, The traditional teaching mode can no longer meet the needs of students in the new era for classroom teaching. In order to provide students with rich and efficient teaching environment, it is necessary to reform and innovate the traditional teaching mode and improve the teaching quality. Based on the in-depth analysis of the course of Electrical and electronic & electronics technology, this paper puts forward the teaching mode of combining online teaching with offline teaching, explores the teaching reform of Electrical and electronic & electronics technology from multiple angles, and provides support and help for future teaching practice.*

**Keywords:** *online teaching, Offline practice, Electrical and electronic & electronics technology courses, Teaching reform, Teaching analysis*

## 1. Introduction

The course of electrical and electronic & electronics technology plays a very important role in cultivating students' practical ability in electronic and electrical specialty. This course is an important index to evaluate students' ability to solve complex engineering problems, According to the requirements of the education department and the teaching characteristics of this course, teachers should reform the traditional teaching methods, clarify teaching concepts and course objectives, scientifically set teaching contents, reasonably formulate teaching syllabus and teaching calendar, continuously improve teaching methods, take students as the main body, implement the teaching mode of combining online teaching with offline teaching, and continuously improve the teaching level of this course.

## 2. Curriculum goal design

### 2.1 Clear teaching philosophy

Nowadays, the teaching idea is to take students as the main body to carry out scientific teaching, and the goal is to improve students' professional ability, train students to use their professional knowledge in electrical and electronic & electronics technology, and solve problems such as system structure design and analysis in complex projects in society.

### 2.2 Establish curriculum objectives

#### 2.2.1 Electronic basic ability

The teaching goal of this course is to enable students to master basic theoretical knowledge through the study of electrical and electronic & electronics technology courses, so that students can have a clear understanding of basic concepts and basic laws such as digital electronics, analog electronics and electronic circuit theoretical framework, sum up key knowledge points and basic analysis methods, and cultivate students' ability to think and summarize and analyze problems.

#### 2.2.2 Ability of electronic circuit analysis and design

It enables students to make correct judgments and analyses on basic circuits or some typical circuits,

and has the ability to identify and analyze practical problems, and independently complete some simple electronic circuit design tasks with corresponding theoretical knowledge.

### ***2.2.3 Certain engineering practice ability***

Through the study of this course, we can cultivate students' practical ability in engineering design, enable students to learn how to operate digital chips, analog chips and commonly used instruments and meters, master experimental test methods, and gain basic experimental ability of electronic systems through practical teaching

## **3. Teaching process design**

### ***3.1 Reasonable formulation of syllabus and teaching calendar***

Through the analysis of the curriculum architecture diagram in Figure 1 below, we make an in-depth analysis of the electrical and electronic & electronics technology course, and make appropriate adjustments to the syllabus in combination with the needs of the development of the times. Keep the total class hours unchanged, increase the number of experimental class hours, and pay attention to the cultivation of students' practical ability. Revise the teaching links, adjust the assessment ratio and formulate the corresponding evaluation and analysis system. Because online teaching needs to be combined in the actual teaching process, the teaching calendar should be changed accordingly, At the beginning of the class, it is necessary to give a special teaching calendar, provide students with instruction manuals, and do a good job of reminding before each class.

### ***3.2 Curriculum system design***

Before the implementation of the curriculum reform, the purpose of drawing up the curriculum implementation map is to make clear the influence of each component link in the teaching process and the connection between each link, This work is the key to whether students can achieve the expected learning results in the end. After drawing up the implementation map, it makes an objective analysis of students' conditions, teachers' conditions and teaching environment, clarifies teaching objectives, innovates teaching strategies based on the traditional teaching model, designs a teaching system combining online and offline, and finally modifies the curriculum design scheme in time according to the actual teaching results.

## **4. Analysis of academic situation**

### ***4.1 Analysis of students' own situation***

By looking up the students' transcripts, we can find out the students that need teachers' attention, and analyze the students' learning situation according to BOPPPS teaching mode, so as to know the students' understanding of this course and their mastery of knowledge.

### ***4.2 Analysis of teaching conditions***

Firstly, the software and hardware conditions in the teaching environment are analyzed to find out whether the online teaching resources meet the actual teaching needs. Secondly, it analyzes teachers' teaching ability, clarifies the teaching plan, improves teachers' skills application ability in information technology, and grasps students' online learning situation in time.

### ***4.3 Analysis of teaching effect***

Teachers need to fully understand the class students' listening situation, carry out all batch and all-round modification of homework, analyze teaching achievements and make more reasonable teaching plans in time.

## 5. Teaching evaluation design

### 5.1 Evaluation Scheme

According to the actual situation, adjust the evaluation scoring method. Improve the proportion of process evaluation, pay more attention to students' classroom performance, homework and initiative in autonomous learning, and reduce the proportion of final grade in total score.

### 5.2 Evaluation and Analysis

#### 5.2.1 Quantitative analysis

Understand students' homework completion, test scores and participation in other activities, and comprehensively analyze students' completion data and test score data, so that students can use the basic knowledge they have learned to solve problems such as system structure design and analysis in complex projects; At the same time, focusing on the calculation of the degree of achievement of curriculum objectives, the deficiencies are continuously improved, and the cultivation and training of engineering concepts and engineering practices are mainly strengthened.

#### 5.2.2 Qualitative analysis

Design a questionnaire around the education curriculum outline, know the students' learning situation of online cloud class, and make the next teaching plan to improve continuously according to the feedback data, so as to improve the students' learning effect.

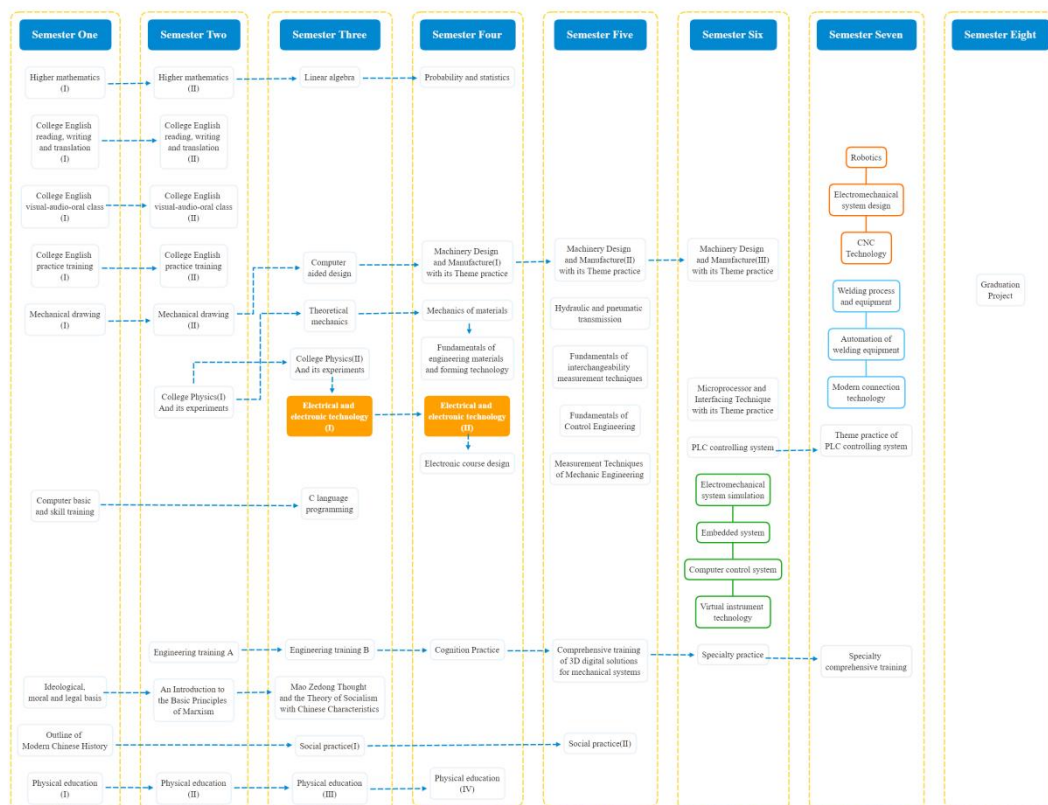


Figure 1 Curriculum Architecture Diagram

Note: Electrical and electronic & electronics technology (1) and Electrical and electronic & electronics technology (2) are required professional basic courses in two semesters, which constitute a complete curriculum system.

## 6. Continuous improvement mechanism

### 6.1 Strengthen the connection with real life

Students' practical ability is the key training goal in the process of teaching and training in the new era, in the teaching reform, we should strengthen the cultivation of students' practical ability, strengthen the connection between online basic theoretical knowledge and offline real life, and enhance students' ability to solve practical problems.

### 6.2 Quoting advanced educational technology

Nowadays, with the continuous development and progress of information technology, we can try to introduce simulation, animation and intelligent tool teaching in the teaching process, Based on the teaching concept of combining TLLM with flip classroom, students can learn independently online in advance and communicate actively with teachers in class to achieve better learning results.

### 6.3 Summarize and revise the teaching plan in time

Teachers find out the problems in the process of teaching reform in time, consider the rationality of teaching evaluation design, revise the teaching plan correctly, promote the organic combination of online and offline teaching modes, and improve the teaching effect.

## 7. Conclusion

In the continuous exploration and research, some achievements have been made in the teaching reform of electrical and electronic & electronics technology course, but there are still many shortcomings and areas for improvement in the work, which require educators to continue to study and try to solve these problems. With the development of the times and the progress of technology, the teaching mode of combining online and offline is the inevitable development trend of future teaching, In the future, we will continue to further explore and innovate the teaching reform of electrical and electronic & electronics technology in accordance with the syllabus and social development requirements, fully mobilize students' enthusiasm for learning, comprehensively improve the teaching level of electrical and electronic & electronics technology, and cultivate more talents suitable for the development of the new era.

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