

# How to Design Lead Text of Systematic Course of Working Process---Take “Power Electronic Technology” Curriculum for Example

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**Keyword:** Systematic course of working process; Lead text; Design; Power electronic technology

**Abstract.** The objective of this paper is to introduce how to design lead text of systematic course of working process. It takes “Power Electronic Technology” curriculum for example to introduce basis, method and method of the designed lead text and gives the lead text about the dimming lamp circuit based on systematic course of working process. These could improve the teaching quality and make students grasp more methods and ways of study independently, help them know "how to study".

## Introduction

The systematic course of working process is task driven teaching with wok process oriented, in accordance with the steps of "to assign tasks, to work out learning plans, physical and practical teaching, to complete the work order , to develop training programs and training operations, to sum up the evaluation"[1]. Teaching method of lead text is a teaching method to lead students to study and work independently with guidance documents and other teaching documents [2]. Students can clear the learning objectives of systematic course of working process, the working process and the professional knowledge and skills related by the lead text.

Developing lead text combining with the actual working process and leading students to study independently can make students to adapt to the enterprise post demand for the updated professional knowledge and skills constantly [3]. And they can improve students' comprehensive quality; cultivate students' innovation consciousness and innovation ability. This article will take the power electronic technology course as an example, and describe how to design the lead text of systematic course of working process.

## The Basis of Designing Lead Text

**With Wok Process Oriented.** Task group set up professional research team and researched on industry, enterprise. The power electronic technology course mainly faced the posts is determined combining with the local economy. From the investigation results, we found that the demand of maintenance electrician position is great, the professional skill requirements is highest [4]. So maintenance electrician was identified as the core position at last. We analyzed professional ability of working area and typical work tasks and determined the professional training goal and professional curriculum system with enterprise expert. The professional steering committee which enterprise experts were the main body was set up, guided and participated in the development of professional talent training scheme. They transformed professional standards into teaching content of specialized courses.

**With Work Task Based.** According to the professional training goal, course training target was definite, typical tasks of the maintenance electrician were as course carrier, curriculum structure of systematic course of working process was developed and course standard of "The power electronic technology" was draw up [5]. To work process as the main line, to design the lead text of "The power electronic technology" course and to determine learning task and working job could cultivate the students' vocational skills and quality.

## The Construction of Lead Text

Teaching organization form, teaching media and teaching materials are decided by the construction of lead text [6]. The lead text of different professional field and different major is not alike. The lead text of systematic course of working process should be composed of the following sections [7].

**Task Description.** The task description of lead text is the statement of work of systematic course of working process. It can be expressed in the form of text or chart.

**Leading Question.** According to these problems, students should do the following five requirements: imagining the whole process of work task; imagining the final results of the work; arranging the working process; getting the information of work; planning work.

**Description of the Studying Purpose.** Students should be able to know what he can learn from the lead text.

**Monitoring List of Learning Quality.** The purpose of monitoring list of learning quality is to make the student to avoid the blindness of work and ensure that each step is carried out smoothly.

**Work Plan.** The students accomplish independently, discuss with teachers; write the steps, the necessary materials, time, tools and equipment of this work plan.

**Inspection.** According to the given quality standards, the students check it up independently.

**Professional Information.** In order to better develop students' ability to finish the homework, ready-made material information is not provided by the teachers, obtain this information channels are provided only, it can cultivate students' ability in obtaining professional information independently and deal with these information occupant's social ability

**Guidance Note.** Relevant work process, quality requirements, labor safety, operating instruction and so on.

In the above parts, job description, guiding question, work plan, and check list is the most important components in lead text. The teachers in the actual design process of lead text, according to the need of the course content and teaching purpose, the structure of lead text can be appropriately increase or decrease and adjustment [8].

## Application Case of Lead Text

We will take "Power Electronic Technology" course as an example, and design the lead text of the dimmer lamp circuit as follows:

Task name: The design and analysis of the dimmer lamp circuit

Name:\_\_\_\_\_ Class:\_\_\_\_\_ Student number:\_\_\_\_\_ Self-evaluation scores:\_\_\_\_\_

**Learning Goals.** Knowledge objective:

- 1 Master conditions of thyristor which is conductive and shut off;
- 2 Master the basic operation principle of dimming circuit which is made up of thyristor;
- 3 Master how the dimming circuit is analyzed and designed.

Skill goals:

- 1 Identify the model and pin of thyristor quickly;
- 2 Collect and sort data of the dimming circuit;
- 3 Design the dimming circuit independently;
- 4 Simulate the dimming circuit with Proteus;
- 5 Weld and debug circuit according to the technological requirements.

**Material Provided.** 1 Chen Zicheng, Practical electronic circuit design and debugging;

2 Yao Fu'an, Electronic circuit design and practice;

3 Wang Zhao'an, power electronic technology.

**Guiding Question.** 1 Which method is used to enable the thyristor pin to be quickly identified?

2 What is the breakover and shutdown prerequisite for the thyristor?

3 According to the circuit diagram 1, main circuit and control circuit are marked by different color pen (Circuit shown in Fig. 1.) [9];

4 Please specify the structure of main circuit power supply, draw the waveform of input and output;

5 Please analyze the control process of control circuit;

6 Please Simulate the designed circuit with Proteus, and observe the output waveform with oscilloscope.

**The Requirements of Making and Debugging Circuit.** 1 Please weld circuit from left to right and from top to bottom According to the circuit principle diagram, wires should connect at the back of circuit board [10];

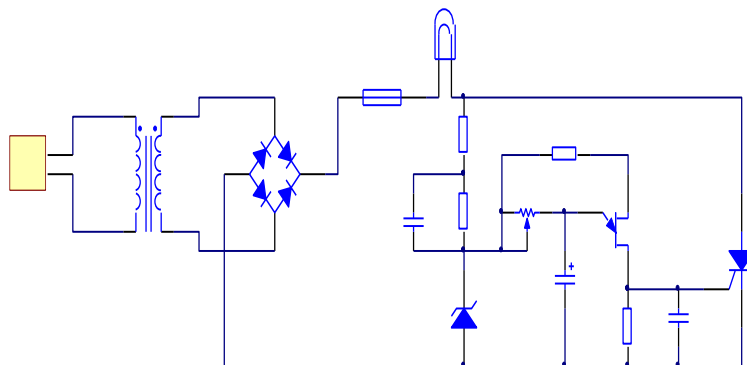


Figure 1. Circuit of dimming lamp

2 The public ground terminal should be always under the circuit board when you weld to ensure the direction of circuit board is not wrong;

3 The connected dots of circuit should be concise to ensure the welding quality;

4 After comparing figure with the welding circuit and check the welding circuit, you can electricity and debug if there are not faults.

5 You should debug the main circuit after debugging the control circuit.

**Work Plan.** 1 Develop a work plan

2 Discuss your work plan with your instructor and record the adjustment suggestion.

**Task Implement.** Determine the division plan, work independently and fill out following forms.

Table 1 List of assignment

Order	Tools and instrument name	Method of using tools	Making circuit
Order	Circuit simulation	Debugging hardware circuit	Result

**Evaluation and Summary.** Please contrast study goal and the evaluation gauge, evaluation of the group study and fill out following forms.

## Acknowledgement

Design the lead text of systematic course of working process in the teaching process of 'Power Electronic Technology' is beneficial to the improvement of teaching and let students to master the correct key in learning. Let students grasp more methods and ways of study, help them know "how to study". These could build a solid foundation for lifelong learning and skills for students. It will be of great importance in improving their professional quality and develop their career skills.

Table 2 List of work quality evaluation

Task name	Analysis and design of dimming lamp circuit				
Leader		Members			
Evaluation item	Evaluation criterion	Weight	Self-evaluation	Mutual evaluation	Teacher' s evaluation
Learning attitude (30)	Earnest, positive	5			
	Respect for others, work hand in glove, harmonious atmosphere	5			
	Make full use of various resources to analyze problems	10			
	Find the problem positively and analyze problems carefully	10			
Learning effect (70)	Identify thyristor model and pin with instrument	10			
	Confirm the conditions of thyristor whether is conducted or turn off	15			
	Analyze the dimmer lamp principle of work	20			
	Record the experimental data correctly	25			
Suggestion of teaching and learning					

## References

- [1] Xu Guoqing. The practice orientation research of curriculum of vocational education: canonical form of technology. Shanghai: Shanghai Educational Publishing House, 2005
- [2] Shi Weiping. Problems and ideas of vocational education curriculum reform in our country [J]. Vocational and Technical Education, 2005
- [3] Kong Lingqiu. A primary study on lead text of systemized course of working process .Modern Education, 2011
- [4] Liu Junyi. Teaching Method of Electrical and Electrical Professional .Publishing House of Electronics Industry, 2012
- [5] Lin Su. The Evaluation System Research Based on the Working Process Systematization of the Practice Teaching Quality 2013 3rd International Conference on Social Sciences and Society (ICSSS 2013) 2013.12
- [6] Rongsheng Chang. Application of lead text teaching method based on systematic course of working process. China Power Education. 2011

- [7] Dou Chen. Design and implementation of lead text teaching method based on systematic course of working process-taking “The analysis and application of electrical circuit” for example. Journal of Yangling Vocational and Technical College.2012
- [8] Hongfei Liao. Design and research of projectized course based on working process. Vocational Education Communication.2013
- [9] Peiyu Li. The course construction of Electronic Technology Application major based on systematic course of working process in higher vocational colleges. Vocational and Technical Education.2009
- [10] Ji Suo. Discuss about ‘Power Electronic Technology’ application based on working process. Vocational Education Communication.2011