Reform and Exploration in Applied Modern Communication Principle Course under the Background of Accreditation of Engineering Education

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Abstract. Under the background of accreditation of engineering education, applied teaching is set as the curriculum objective and curriculum orientation, teaching content and the evaluation for the achievement degree of curriculum objectives are discussed in applied modern communication principle course. The aim is to achieve the accreditation of engineering education through teaching practices.

Introduction

The essence of accreditation [1] is strengthening the role of quality evaluation [2], guiding curriculum construction [3] and improving teaching quality based on the teaching quality management system. The applied modern communication principle course plays an role in training talents for communication engineering. In applied modern communication principle course, the teaching quality management system is taken as the guidance, student’s application ability [4] and quality ability [5] is intended to be cultivated, and curriculum orientation, teaching content and the evaluation for the achievement degree of curriculum objectives are introduced.

Curriculum Positioning

Positioning and Function of Applied Modern Communication Principle Course in Training Program

Applied modern communication principle course plays an obvious role in cultivating student’s application ability and quality ability and fully embodies the requirements of professionalism and practicality.

Curriculum Objective

Knowledge objective, skill objective, emotion objective and task objective that curriculum objective 1, curriculum objective 2, curriculum objective 3 and curriculum objective 4 are consisted of curriculum objective in applied modern communication principle course and are omitted later.

Corresponding Relationship between Curriculum Objectives and Graduation Requirement Index Point

This course supports graduation requirement index point 1.3, 2.1, 2.2, 2.3 and 12.1 that are list in cultivating scheme of undergraduate.

Curriculum objective 1 corresponds to graduation requirement index 1.3. Curriculum objective 2 corresponds to graduation requirement index 2.1 and 2.2. Curriculum objective 3 corresponds to graduation requirement index 12.1. Curriculum objective 4 corresponds to graduation requirement index 2.3. Corresponding relationship between curriculum objectives and graduation requirement index point in modern communication principle course is shown in Table 1.
Table 1. Corresponding Relationship between Curriculum Objectives and Graduation Requirement Index Point in Modern Communication Principle Course.

| Graduation Requirement Index Point | Curriculum Objectives | 1.3 | 2.1 | 2.2 | 2.3 | 12.1 |
|-----------------------------------|-----------------------|-----|-----|-----|-----|------|
| curriculum objective 1            |                       | 1   |     |     |     |      |
| curriculum objective 2            |                       |     | 1   |     |     |      |
| curriculum objective 3            |                       |     |     |     |     | 1    |
| curriculum objective 4            |                       |     |     |     |     |      |

Evaluation for the Achievement Degree of Curriculum Objectives

Examination Modes

Modern communication principle course adopts process assessment, including all the contents listed in the syllabus. The weight of attendance, class performance, group discussion, experimental results and experimental reports in total score are $a_1$, $a_2$, $a_3$, $a_4$ and $a_5$ respectively and they are both 100%. Supporting of examination modes for curriculum objective in modern communication principle course is shown in Table 2.

Table 2. Supporting of Examination Modes for Curriculum Objective in Modern Communication Principle Course.

| the composition and the proportion of target score | examination modes | target score | Assessment rules | curriculum objective |
|---------------------------------------------------|-------------------|--------------|------------------|---------------------|
| total score of 10 and the proportion of target score is $a_1$ | attendance | 10 | Attendance and classroom discipline | 3 |
| total score of 10 and the proportion of target score is $a_2$ | class performance | 10 | answer questions and interact with teachers | 1 |
| total score of 16 and the proportion of target score is $a_3$ | group discussion | 16 | autonomous learning and teamwork | 2 |
| total score of 32 and the proportion of target score is $a_4$ | experimental result | 32 | include simulation, equipment commissioning, fault location, fault reason analysis, etc. | 4 |
| total score of 32 and the proportion of target score is $a_5$ | experimental report | 32 | the quality of experimental reports | 3 |

Assessment Rules

The assessment method of modern communication principle course is the test. The specific form is the process assessment. The result is composed of 100% of the process assessment. The process assessment consists of five modules that include attendance accounting for 10%, classroom performance accounting for10%, group discussion accounting for16%, experimental results accounting for 32% and experimental reports accounting for 32% of the total. The assessment rules are detailed in the process assessment scheme.

Evaluation for the Achievement Degree of Curriculum Objectives

The computational methods of the evaluation for the achievement degree of curriculum objectives is equal to the average score of the correlative examination mode that supports the curriculum objective minus the total score of the correlative examination mode that supports the curriculum objective.

The computational method of the evaluation for the achievement degree of curriculum overall objective is equal to the students’ average score of the course minus the total score of the course.

The total score of attendance that supports curriculum objective 3 is 10 and the students’ average score is $A_1$. The total score of classroom performance that supports curriculum objective 1 is 10.
and the students’ average score is A2. The total score of group discussion that supports curriculum objective 2 is 16 and the students’ average score is A3. The total score of experimental result that supports curriculum objective 4 is 32 and the students’ average score is A4. The total score of experimental report that supports curriculum objective 3 is 32 and the students’ average score is A5.

The total score of the course is 100 and the students’ average score of the course is $A_1 + A_2 + A_3 + A_4 + A_5$. Evaluation for the achievement degree of curriculum objectives in modern communication principle course is shown in Table 3.

| evaluation content | the composition | total score |
|--------------------|-----------------|-------------|
| course objective 3 | course objective 1 | course objective 2 | course objective 4 | course objective 3 |
| target score       | 10              | 16          | 32            | 32            | 100         |
| average score      | A1              | A2          | A3            | A4            | A5          | $A_1 + A_2 + A_3 + A_4 + A_5$ |

The achievement degree of curriculum objective 1 is $A_2 - 10$. The achievement degree of curriculum objective 2 is $A_3 - 16$. The achievement degree of curriculum objective 3 is the sum of $A_1$ and $A_5 - 42$. The achievement degree of curriculum objective 4 is $A_4 - 32$. And the achievement degree of curriculum overall objective is the sum of $A_1$, $A_2$, $A_3$, $A_4$ and $A_5$ minus 100. Specification of the evaluation for the achievement degree of curriculum objectives in modern communication principle course is shown in Table 4.

| course objective | examination mode | target score | average score | the evaluation for the achievement degree of curriculum objectives |
|------------------|------------------|--------------|---------------|---------------------------------------------------------------|
| course objective 1 | classroom performance | 10          | A2            | $A_2/10$                                                      |
| course objective 2 | group discussion  | 16          | A3            | $A_3/16$                                                      |
| course objective 3 | attendance       | 10          | A1            | $(A_1 + A_5)/42$                                             |
|                  | experimental report | 32          | A5            |                                                              |
| course objective 4 | experimental result | 32          | A4            | $A_4/32$                                                      |
| course objective  | total score      | 100         | A1 + A2 + A3 + A4 + A5 | $(A_1 + A_2 + A_3 + A_4 + A_5)/100$ |

### Teaching Content

In modern communication principle course, teaching content includes analog communication system, digital baseband communication system and digital band-pass communication system. Analog communication system consists of modulation and demodulation of AM, modulation and demodulation of DSB and modulation and demodulation of SSB. AMI, HDB3, coding and decoding of PCM are important parts of digital baseband communication system. Modulation and demodulation of 2ASK, modulation and demodulation of 2FSK, modulation and demodulation of BPSK and BDPSK, modern modulation and demodulation technology are made up of digital band-pass communication system.
Summary

Applied modern communication principle course takes the teaching quality management system to guide curriculum construction and reform. The purpose is to improve the teaching quality and realize the accreditation through practice.

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