

Construction and Teaching Practice of Analytical Chemistry Course in Environmental Science Specialty

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Abstract

Through the construction of the analysis chemistry curriculum group in environmental science, a full range of design and practice is designed from the aspects of teaching syllabus, teaching materials, courses, network courses, paper library, laboratory and scientific research. In this way, we should strengthen the improvement of environmental science professionalism, enhance the cultivation of analytical capability, broaden the students' vision and optimize the teaching of environmental science to improve the comprehensive design and practical analysis ability of environmental science majors. The results can improve design and actual analysis ability of majors multi-level comprehensive in environmental science, to foster a solid environmental science basic theory, basic knowledge and basic skills of senior specialized talents. Thus, it is necessary to cultivate advanced specialized talents with solid basic theories, basic knowledge and basic skills in environmental science.

1. Introduction

Analytical chemistry is an interdisciplinary subject of chemistry and environmental science. It permeates all fields of environmental science and plays the role of scouts. The teaching approach is focus on quality, cultivating ability, strengthening the basis, broaden specialty, strengthen management, and improve the quality. Using the modern technology, optimizing the professional teaching of environment, cultivating compound talents and improving students' comprehensive multi-level design and actual analysis ability, it is established on the basis of theoretical research in environmental science and analysis chemistry curriculum group^[1-2]. the environmental science professional talent training scheme, network course, excellent course, teaching material construction and so on has carried on the practicality of the discussion. Therefore, it has carried on the practical discussion on the training scheme in environmental science professionals, the network course, the fine course and the construction of teaching materials.

2. Specialized analytical chemistry courses in environmental science

The aim of environmental science is to highlight the characteristics of environmental science and the social needs and employment. On the characteristics of the traditional analytical chemistry, instrumental analysis and environmental science, we has carried on the reorganization and established the environmental science major in analytical chemistry course group on the basis of professional course^[3-4], as shown in table 1.

Table 1 Analytical chemistry courses in environmental science

	Course name	semester	total hours	credit
Theoretical Course	analytical chemistry	1	36	2
	instrumental analysis	4	48	3
Experimental course	Basic chemistry experiments (I)	1, 2, 3	153	4
	Basic chemistry experiments (III)	5, 6	51	1.5

3. Writing teaching syllabus and assembling teaching materials of experiment

Based on the study of teaching materials of teaching and management at domestic and foreign, related literature and the latest research results, according to the characteristics of the training objectives and teaching, it was write the outline of theory in "Analytical Chemistry", "Instrumental Analysis" and the outline of basic chemistry experiment in "Curriculum of basic chemistry experiment I", "Curriculum of basic chemistry experiment III". In this way, we should pay great attention to the cultivation of students' comprehensive quality of environment, pay attention to the thinking methods of students' Environmental Science and the cultivation of scientific attitude of seeking truth from facts, at the same time pay attention to environmental protection and advocate green chemistry. To improve the comprehensive quality, the students' experimental skills, cultivate students' scientific thinking method and attitude of seeking truth from facts, we wrote the teaching material of "Instrument Analysis Experiment" and "Analytical Chemistry Experiment" in order to make the reform of experimental teaching in new curriculum system smoothly from "four major chemistry" to "three levels" teaching mode.

4. Network course of "Instrumental Analysis", "Basic chemistry experiment I" and the excellent course of "Analytical Chemistry"

With the help of modern educational technology, which can arouse students' enthusiasm and initiative, can broaden the teaching content, can increase the capacity of teaching, and can improve the teaching schedule, our

professional teaching team, from the need of theoretical and practical teaching, is now constructing the network course of the "Instrumental Analysis", "Analytical Chemistry" and "Basic chemistry experiment I", made of web page by Dreamweaver and course-related animation, pictures and procedures through Flash, Authorware, 3DSMAX etc; designs courseware and demonstrates the content by PPT full of images, text and sound; approaches comprehensive, three-dimensional and multi-perspective teaching mode, combining traditional teaching methods (such as board-writing, charts, models, audio-visual resources) with application of multimedia technology and network technology; adopts flexible teaching methods such as discussion, heuristic and case study, to break time and space limit, to provide massive information and open up students thoughts, to improve their learning enthusiasm and initiative and lead to innovative spirit.

5. Establishing the database of test paper on analytical chemistry and instrumental analysis

Through standardization, the degree of difficulty, reliability and validity, it is established effectively the test question bank of an "Analytical Chemistry" and "instrumental analysis". The management of test questions and test papers will become more efficient and convenient, which plays a very important role in improving work efficiency and standardization and automation of test paper management

6. Opening laboratory for high investment efficiency

Combining with students' skills training and training objectives, the laboratory opening plan was worked out. It was completed 7 items of laboratory opening project. There are 2 items of practice and innovation training program for college students in Jiangsu Province, and 2 projects supported by the innovation fund of Yancheng Teachers University. Through opening laboratory, students' comprehensive quality and experimental skills have been further improved.

7. Scientific research activities related to production practice.

We are organizing students to participating social practice activities in summer vacation and participating research projects of the teacher at ordinary times. By the application of theoretical knowledge in production practice, not only the professional knowledge is consolidated, the industrial production process are understood, but also the practice and scientific research ability are improved. In the past three years, one research projects of enterprises commissioned, three projects of Jiangsu Provincial Education Department and three provincial key construction laboratory projects are finished. It has published twenty papers in teaching research and thirty papers in scientific research. Students use the summer to organize enterprises to participate in social practice activities, usually teachers participate in the research, to apply theoretical knowledge to practice, not only to consolidate professional knowledge, understand the process of industrial production, but also improve the ability of scientific research and practice. In the past 3 years, enterprises have commissioned 1 research projects, 3 projects of Jiangsu Provincial Education Department, 3 provincial key construction laboratory projects. A total of 20 papers on teaching research and more than 30 papers on scientific research were published.

It can promote students' individual development and try new multi-level teaching by teaching of course group in chemical analysis. It is conducive to the division of labor among interdisciplinary and interdisciplinary teachers, and promotes the communication and communication between different majors and different levels of students. Through teaching, exploring the teaching pattern, update teaching content, improve teaching methods, improve teaching level and quality of education and other aspects, it is reflected the advancing of teaching idea, science of education law, integrated theory with practice, innovative characteristic, exemplary achievements.

Acknowledgements

The research is supported by a Project Funded by the brand professional project form Yancheng teachers university (2016), the construction and practice of environmental monitoring curriculum system for environmental science applied talents training form Yancheng teachers university (17YCTCJY011), Teaching Research Project of Yancheng Teachers University (16YCTCJY042) and A Project Funded by the Excellent Specialties Program Development of Jiangsu Higher Education Institutions (PPZY2015B113).

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