

The Teaching Reform of Biological Drug Analysis Course Based on Core Competence Cultivation

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Abstract: This paper discusses the teaching reform of biological drug analysis based on the core competence cultivation. By introducing modern educational concepts, we aim to improve the comprehensive quality and practical ability of our students to better meet the needs of the field of biological drug analysis. The key goal of the reform is to develop students' innovative thinking, experimental skills and research skills to advance their career in the field.

Keywords: Core competence; Biological drug analysis; Curriculum.

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1. Analysis of the current status of the biological drug Analysis course

The traditional teaching of biological drug analysis mainly focuses on the teaching of theoretical knowledge, but lacks practical opportunities. This leads to students gaining a lot of theoretical knowledge in the classroom but feeling overwhelmed in practical application. Biodrug analysis is a highly experimental subject, so the disconnect between theory and practice is a obvious limitation. The field of biological drug analysis is developing rapidly, and new methods and technologies are constantly emerging. However, some teaching materials and teaching resources still remain on the outdated content and are not updated in time. This may prevent students from acquiring the latest knowledge and skills, which can affect their professional competitiveness. In traditional teaching methods, few practical cases are provided to help students apply theoretical knowledge to practical problems. This leads to students having difficulty understanding the practical application of biological drug analysis and lacking the ability to solve practical problems.

2. The importance of developing core competencies in the course of Biodrug Analysis

Core competence refers to the comprehensive literacy and skills of an individual in a specific field to make him or her competent for relevant tasks and jobs. These abilities include knowledge, skills, thinking skills, and interpersonal skills, which are the key elements of an individual's success in a specific field. In the Biodrug Analysis course, the core competencies include proficiency in drug analysis techniques, experimental design and data analysis skills, problem solving skills, and teamwork and communication skills.

Drug analysis is a key link in the field of biomedicine. Correct and accurate results of drug analysis are crucial for new drug development, quality control and disease diagnosis. The cultivation of core competencies can enable students to master various analytical techniques, such as mass spectrometry, chromatography, spectroscopy, etc., so as to accurately analyze the composition and concentration of drugs, and ensure the quality and effectiveness of drugs. Second, core competencies also involve the ability for experimental design and data analysis. In drug analysis, it is crucial to design a rational experimental protocol and accurately analyze the experimental data. Students need to learn to develop experimental plans, choose appropriate analysis methods, and be able to correctly interpret and analyze the experimental results. These skills can help them to better cope with complex drug analysis problems in their practical work. Core competencies can also include problem-solving skills. The field of drug analysis often faces various challenges and problems, such as the complexity of samples, the selection of analytical methods, etc. Developing students' problem-solving skills

allows them to better address these challenges, find innovative solutions, and continually improve their analytical processes.

3. The teaching reform plan of biological drug analysis course based on core competence cultivation

3.1 Resetting and clarity of the course objectives

Experimental skills are a crucial part of the Biodrug Analysis course. In order to make students competent for future research and work, the curriculum objectives should place an explicit emphasis on developing students' experimental skills. This includes the experimental design, operational skills, data analysis, and the ability to interpret the experimental results. With clear course objectives, students will be able to better understand and master the basic principles of experiments, thus improving their experimental ability.

The field of biological drug analysis often involves complex problems and challenges. Therefore, the course objectives should also be clearly defined to cultivate students' problem-solving ability. Students need to learn to analyze and solve practical problems, including how to choose the appropriate experimental method, how to deal with the unexpected situation in the experiment, how to explain and apply the experimental results, etc. With clear course objectives, it will make it easier for students to understand the importance of problem solving and how to use the knowledge learned to solve problems. Biodrug assays often require collaborative collaboration of knowledge and skills across multiple areas of expertise. Therefore, the course objectives should be clearly defined to cultivate students' teamwork ability. Students need to learn to work with colleagues from different backgrounds and specialties to solve complex problems together. With clear course objectives, it will be easier for students to understand the importance of teamwork and how to work effectively together with others.

The field of biological drug analysis involves important issues of ethics and social responsibility, such as bioethics, clinical trial ethics, etc. The curriculum aims to enable them to understand and respect the ethical guidelines, while also recognizing the importance of their research and work to social and human health. Students will be easier to understand the importance of ethical and social responsibility and how to follow relevant guidelines at work. The field of biological drug analysis requires students' good communication skills, including oral and written communication skills. The course objectives should clearly develop students' communication skills, so that they can clearly convey the experimental results, analyze and interpret the data, and communicate effectively with colleagues and superiors. With clear course objectives, students will make it easier to understand the importance of communication skills and how to continuously improve their communication skills.

3.2 Streamlining and optimization of teaching content, highlighting the cultivation of core knowledge and skills

In the traditional "biological drug analysis" course, often contains a lot of knowledge points and experimental technology, but much of the content is not all students must master. The teaching content has been streamlined, with the focus placed on the core knowledge and skills. Clarify the core knowledge points that students must master, including the structure and function of biological drugs, the principle and application of analytical methods, etc., only retain the content related to the core knowledge points, to reduce the cognitive burden of students. In addition, teaching methods should be optimized to better develop students' core competencies. Students are encouraged to study by asking questions and solving them. Develop their critical thinking and problem-solving skills. Students are encouraged to collaborate in small groups to solve problems and complete the experiments. Develop their teamwork and communication skills. Introduce actual biological drug analysis cases, allowing students to apply the knowledge they have learned to solve practical problems and cultivate their application ability. Provide sufficient laboratory practice opportunities for students to conduct biological drug analysis experiments and develop their practical skills.

Introduce case analysis, experimental operation and other practical links to strengthen the cultivation of students' application ability

In the course of Biodrug Analysis, the introduction of case analysis can help students combine their theoretical knowledge with practical problems and develop their problem-solving ability. Teachers can choose some real biological drug analysis cases, and ask the students to analyze and solve the problems in these cases. Through this process, students will learn how to apply the knowledge learned to solve practical problems, but also to develop their analytical and judgment skills. By discussing real cases, students can better understand the importance and practical application of biological drug analysis. They will be more actively involved in the course, actively asking questions and thinking about solutions. This enthusiasm is very important for students' learning and growth.

Experimental manipulation is an integral part of the biological drug analysis course. Through experimental operation, master the use of various biological drug analysis technologies and instruments, and improve their practical operation ability. In order to strengthen the students' application ability, we can take the following measures: add more experimental courses to the course, covering different biological drug analysis techniques and methods. This gives students more opportunities to actually operate and improve their skill levels. Design specific experimental cases for each experiment, and let the students face the practical problems and solve them in the experiment. This helps to cultivate students' practical problem-solving ability. Organize students to carry out team experiments, let them learn the division of labor and cooperation in the cooperation, and complete the experimental tasks together. This helps to develop the students' teamwork ability. Educate students to strictly abide by the safety regulations in experiments, and pay attention to the accuracy and repeatability of experimental results. This helps to develop students' experimental skills and quality awareness.

3.3 Combined with modern educational technology means, improve the teaching effect

With the continuous progress of science and technology, the field of education has gradually integrated into a variety of modern educational technologies, which provide more possibilities for teaching. In the course of "Biological drug analysis", make full use of modern educational technology to improve the teaching effect. Biological drug analysis involves complex experimental operations and techniques, but traditional laboratories have limited resources and students may not be able to personally participate in all experiments. To solve this problem, we will set up a virtual laboratory, through simulation experiments, students in the virtual environment, so as to increase their practical experience. Virtual laboratories can also provide more experimental cases, allowing students to have a more comprehensive understanding of all aspects of biological drug analysis. Open online courses so that students can learn more flexibly. The online course will cover all aspects of biological drug analysis, including instrument operation, data analysis, quality control and more. In addition, we will also provide rich online resources, including teaching videos, courseware, references, etc., to help students to study and research deeply. Develop students' practical skills to make them more competitive in their work.

4. Conclusion

Through the teaching reform of "Biological drug Analysis" course, it is hoped to better meet the needs of students, improve their core competence, and make them have better competitiveness and employment opportunities. This series of reform measures will help to strengthen the quality of education, improve the comprehensive quality of students, and promote the development of the field of biological drug analysis. We will continue to pay attention to the implementation effect of the reform, and constantly optimize the course content, to adapt to the future challenges and opportunities. Hopefully, this reform will bring more benefits to the students and the industry.

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