

Course System Design for Pharmaceutical Engineering

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ABSTRACT. *The pharmaceutical engineering major is a relatively young engineering major, with the goal of cultivating technical personnel engaged in pharmaceutical manufacturing engineering. This article introduces the construction measures and practical experience of our hospital's pharmaceutical engineering major in the construction of a professional curriculum system, strengthening in-class practical links, and enriching extracurricular professional activities.*

KEYWORDS. *college; pharmaceutical engineering major; construction of subject system*

1. Introduction

The pharmaceutical engineering major is an engineering major that crosses chemistry, pharmacy and engineering with the goal of cultivating technical personnel engaged in pharmaceutical manufacturing engineering. It not only focuses on the cultivation of students' ideological and moral qualities and cultural qualities, but also on the cultivation of students' professional qualities. At the same time, this major is also a highly practical major, which not only requires students to have solid theoretical basic knowledge, but also requires students to have proficient operating skills and innovative capabilities, which lays a solid foundation for adapting to social needs and technological innovation in the future. In recent years, the college has implemented practical teaching system reform in the whole school. The practical teaching system reform project of the pharmaceutical engineering major has been included in the construction project of the college, and has accumulated rich experience in the construction of practical links inside and outside the curriculum. According to the norms of science and engineering undergraduate pharmaceutical engineering majors in universities and colleges and the goal of training applied talents, on the basis of the existing curriculum construction, laboratory construction, and practical teaching system construction, integrate resources, add professional related courses, adjust professional teaching plans, and establish systems Curriculum system, perfect professional training program; strengthen practical links, organically combine practical teaching with theoretical teaching, and integrate theory-practical teaching; enrich students' extracurricular professional activities, and create a positive and diverse style of professional learning.

2. Establish the curriculum system of pharmaceutical Engineering major

In addition to receiving knowledge of humanities and social sciences, natural sciences, physical education and foreign languages, professional students should also receive training in relevant professional knowledge. Professional curriculum should reflect the broad caliber, thick foundation, heavy ability, comprehensive talent training program. The curriculum system is composed of five courses, namely, public basic course, chemistry and chemical engineering course, biology and engineering course, pharmacy and technology course, and medicine and pharmacy course. Public basic courses mainly include humanities, social sciences, natural sciences, foreign languages and other related courses. The courses of chemistry and chemical engineering mainly include inorganic and analytical chemistry, organic chemistry, instrumental analysis and so on. The curriculum group of biology and engineering mainly includes biochemistry, industrial microbiology, principle of process engineering, chemical design, etc. The courses of pharmacy and technology mainly include drug synthesis reaction, pharmaceutical technology, pharmaceutical separation engineering, etc. The course group of medicine mainly includes pharmaceutical chemistry, pharmacy and pharmacy regulations, pharmacology, foundation of medicine and pharmacy, etc. According to the students accept ability and the relationship between curriculum continuity, professional required courses teaching order: stage (inorganic and analytical chemistry, organic chemistry, physical chemistry) - to improve phase (biochemistry, instrumental analysis, engineering graphics - principles of industrial microbe, process engineering) - professional stage (synthetic drug reactions - drug chemistry, pharmacy and pharmaceutical affairs laws and regulations, chemical, pharmaceutical technology, pharmaceutical separation engineering - pharmacology). , the amount of time spent in stage 1, 2, 3 for junior students semester courses completed, students at this stage is given priority to with learning public required course, professional basic course arrangement is looser, improve phase mainly for 4, 5 semester courses, the curriculum is foundation stage closely, professional stage for the 5, 6 semester courses, course arrangement is very compact. In order to expand students' knowledge, broaden the employment channels, courses in addition to the opening of a drug design, pharmacognosy, natural pharmaceutical chemistry, and other regular courses, also according to the current social demand and market orientation, set up the engineering software application, biological pharmaceutical technology, chemical equipment corrosion and protection, such as courses, elective courses opened in the seventh semester, students can choose courses according to future employment direction for themselves. The setting of the curriculum system enables students to have both solid and broad basic theoretical knowledge and professional expertise.

3. Strengthen the practice in class

Practical teaching is not only an important link between theory and practice, but also an important way to train students' basic skills, develop their intelligence and comprehensively improve their quality. It is also the basis for students to adapt to social needs and carry out technological innovation in the future. In consideration of students' learning process and adaptability, in the lower grades, relevant experimental contents are arranged for the purpose of serving theoretical courses and testing theoretical knowledge. This not only trains students' operational ability, but also deepens their understanding of theoretical knowledge and lays a solid theoretical foundation. In the senior grade, with the goal of "strong foundation, extensive knowledge and strong ability", the content of experimental courses such as professional experiments and comprehensive experiments should be reformed to increase the proportion of comprehensive and designed experiments and reduce the duration of confirmative experiments, so as to make experiments more researchable and exploratory. The experimental design covers three aspects of chemical, biological and traditional Chinese medicine, including product development or preparation -- characterization of properties and structures -- determination of pharmacological activity -- preparation and other "one-stop" technologies, enabling students to master a complete set of pharmaceutical technologies. According to the knowledge and experimental basis, students can consult literature, design experiments, and independently complete experiments, which organically links theoretical teaching and practical teaching. It not only trains the thinking ability and innovation ability, but also strengthens the ability to find and solve problems.

Understanding practice and production practice are the two most important links of professional practice. Professional signed internship training cooperation agreement with city related enterprises, set up campus practice teaching base, the base covers chemical raw material production, the production of natural medicines, drug intermediates, active pharmaceutical ingredients that can cover the pharmaceutical industry chain, such as production related enterprises, fully embodies the professionalism, standardization, advanced and practical, become a collection of teaching, product development, production as well as the combined multifunctional practice teaching of vocational skills training base. Every year, a fixed number of professional students come to the base for understanding and production practice. In terms of understanding the arrangement of internship, four representative professional enterprises are arranged: large chemical background enterprises, plant extraction and separation enterprises, chemical pharmaceutical enterprises, and microbial pharmaceutical enterprises, so that

students can understand the current situation of professional enterprises. In the stage of production practice, students are not only required to participate in the field practice and professional training of the practice base and the production, learning and research base, but also to be connected with the future graduation design and employment direction, so that students can choose the direction of internship, graduation thesis and employment to achieve integration.

In addition, in the course design, the second class, graduation design and other stages, pay attention to cultivate students' thinking ability, analysis and problem solving ability.

4. Conclusion

Due to the biological and pharmaceutical engineering in the enrollment of students, students in the lower grades have a very weak understanding of the major, in the course of learning feel at a loss, do not know how to learn the course and the major. In order to deepen students' understanding of their major, pharmaceutical engineering professional associations were set up among junior students, and various extracurricular professional activities were regularly organized and planned to deepen students' understanding of their major. In order to broaden students' knowledge and let students know about the relevant industries of their majors, leaders of enterprises related to their majors in Province are regularly invited to give lectures to students. In addition, the branch has set up science and technology innovation projects for college students, in which students can choose small papers, small studies, small inventions, small productions and other activities according to their own interests and hobbies, and also participate in the research projects of professional teachers. The multi-level and multi-function professional activities, not only can build a kind of positive professional learning, strengthen the students' professional skills and innovation ability, form their own features in professional knowledge and skills, and can make the students' divergent thinking, scientific and technological innovation ability further exercise, comprehensive training and improve students' comprehensive qualities.

References

- [1] Yuan Yingjin, You Qidong, YU Yifeng, JIANG Jianlan, Zhao Guangrong, Cheng Maosheng, Yao Risheng, Song Hang. Research on the Construction of Pharmaceutical Engineering Undergraduate Major [J]. Chemical Engineering Higher Education, 2006, (1): 12-15.
- [2] Wu Yulin, Liu Junhong, Wang Fanye, Yang Fengke. Research on talent Training Mode of Pharmaceutical Engineering Major under large-caliber enrollment [J]. Science and Technology Innovation Bulletin, 2010, (15): 14.
- [3] Shen Yue. Design of green Organic Chemistry Experimental System for Pharmaceutical Engineering Major [J]. Guangzhou Chemical Industry, 2016, 46(06): 113-114.
- [4] Guo Zengtian. Engineering Design, Development and Practice of Pharmaceutical Water System [D]. Tianjin University, 2017.