

# Teaching Practice Reform of “Irrigation and Drainage Engineering”

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**Abstract** : With the progress of science and technology, the development of agriculture in China is imminent, and the construction of irrigation and water conservancy plays an extremely important role. “Irrigation and drainage engineering” is the core professional course of agricultural water conservancy engineering undergraduate major. The teaching practice reform of the course should be adjusted with the development of society. The teaching concept of the new era should be implemented; the teaching mode should be changed; the corresponding content should be changed; and the core content and problems should be taken as the guidance to cultivate the high-quality talents to meet the needs of social development.

**Keywords** : Irrigation and Drainage Engineering; Teaching Reform; Practice Reform

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Irrigation and water conservancy is the lifeblood of agriculture. It plays an important role in rural economy and rural modernization development. At the same time, it is also an infrastructure construction of social development. “Irrigation and drainage engineering” is one of the major courses of agricultural water and soil engineering. It is a service-oriented course for the development of modern agriculture, including the water condition of farmland and the change law of water regime.

“Irrigation and drainage engineering” is the core education textbook of irrigation and drainage technology course teaching in colleges and universities. It is an interdisciplinary subject between agronomy and engineering. The course pays attention to both theory and practice. It is a subject combining curriculum and practice. The teaching reform of this course is to strengthen theoretical knowledge, cultivate students’ ability of practice, experiment, design and innovation, stimulate students’ innovative thinking, improve students’ practical ability, innovative ability and comprehensive design ability. The implementation of curriculum teaching reform has important research value to stimulate students’ interest in learning, improve their practical ability, comprehensive design ability and innovation ability.

## 1. Theory teaching module

### 1.1 Strengthening theoretical teaching

“Irrigation and drainage engineering” is the core education textbook of the course of irrigation and drainage technology in colleges and universities. It is a subject to eliminate the adverse effects of insufficient or excessive natural precipitation on agricultural production by means of manual regulation, including the regulation of regional water resources and the distribution of soil water, and the prevention and control of natural disasters such as water logging, drought, salinity and so on, so as to promote the realization of sustainable development in high, good and stable agricultural production. This paper systematically expounds the relevant contents of irrigation and drainage engineering in China; introduces the principle of farmland irrigation, and expounds the

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quantitative relationship between soil, plant and water in the current farmland irrigation mode. Taking the law of soil water movement as a reference, it introduces the basic equation of water movement and the water production function; describes the irrigation water source engineering, irrigation channel engineering, irrigation pipeline engineering; and describes the water production function. At the same time, the development prospect of irrigation and drainage engineering is introduced.

In order to strengthen students' interest in professional courses, teachers must consider the combination of theory and practice, rather than just mentioning it in the classroom. With the deepening of the current education reform, in the process of teaching professional knowledge, we should not only follow the original professional teaching principles, but also learn from each other, introduce excellent teaching concepts of other related professional education; learn from the talent training mode and education system of other professional disciplines; form an interdisciplinary mode, and further improve the rationality of water conservancy and irrigation engineering education.

## **1. 2 Adjusting the teaching mode**

Although today's classroom has introduced the multimedia courseware teaching mode, the teaching mode of this course is basically limited to slide courseware, lacking of relevant high-quality dynamic multimedia courseware, and does not give full play to the advantages of multimedia teaching, and the teaching effect has not been significantly improved.

In the process of teaching, teachers should combine the traditional blackboard teaching mode with multimedia teaching mode, especially pay more attention to the quality of multimedia teaching. For example, more creative and dynamic multimedia courseware should be introduced to vividly describe the teaching contents of irrigation water intake method, working principle and channel system layout of pipeline irrigation, drip irrigation, sprinkler irrigation, micro irrigation, infiltration irrigation and other irrigation technologies, which will help to avoid the shortcomings of traditional teaching principles such as abstraction and lack of physical demonstration, and increase the amount of information provided in the classroom. So that teachers can spend more energy and time on the key and difficult problems of teaching.

## **1. 3 Enriching teaching methods**

Multimedia technology integrates the advantages of audio-visual, graphics, text and other multimedia, so that different media can be flexibly, dynamically and organically connected. Therefore, multimedia technology can use vivid form to explain the principle of irrigation system, schematic diagram of irrigation system design, channel design and other course contents in the process of course teaching, which avoids the traditional education needs a lot of time and energy, it is difficult to achieve accurate, lack of physical demonstration and expression, and the content is too abstract and difficult to understand, which increases the shortcomings in unit teaching. The amount of information transmitted enables teachers to spend more energy and time on teaching difficulties, key points and analysis methods.

# **2. Practical teaching module**

## **2. 1 Strengthening practice teaching**

As an important part of teaching activities, practice course can enable students to understand and digest the theoretical knowledge in the classroom, improve their ability of independent observation and thinking, cultivate students' practical skills, enable students to apply what they have learned, and achieve the goal of integrating theory with practice and achieving the goal of education.

After students master certain knowledge and skills, students can be encouraged to participate in specific projects within the scope of teachers' responsibilities. Teachers can arrange students' work within the scope of students' personal ability, improve students' ability to solve practical technical problems, and ensure that graduates have the technical skills needed to design, implement, organize and manage engineering projects.

## **2. 2 Curriculum design**

Curriculum design is another important part of irrigation and drainage engineering. Through the course design, students can have a comprehensive and in-depth understanding of the course, solve simple practical problems, and use theoretical knowledge to provide a good basis for graduation design.

The theme of curriculum design should be practical and relevant. Students should draw the planned irrigation area map and check the irrigation area and water source according to the actual technical requirements. Later, when carrying out the curriculum design, students will be interested in the design and actively use the theoretical knowledge to complete the curriculum design, so as to achieve the purpose of curriculum design. At the same time, we should optimize the design means, strengthen the use of norms,

on the basis of mastering the principle part of the curriculum design, according to the irrigation and drainage technology design of the local planning institute, select the content suitable for the education characteristics, and actively guide the students to master the advanced design means.

### 2.3 Scientific research guidance

With scientific research projects as the driving force, stimulate students' interest in learning and cultivate innovative talents. Guide students to be brave in innovation and stimulate their interest in research and exploration. In the process of teaching, students should be encouraged to organize open experiments independently, consult materials, design experimental objectives and contents, select experimental materials, operate and process data, so that students can feel the experimental process, accumulate experience, and cultivate the ability of communication and cooperation in the process of carrying out independent experiments. At the same time, relying on teaching and research projects, encourage students to actively apply for college students' innovation and entrepreneurship projects, obtain corresponding innovation and entrepreneurship credits, and master corresponding skills. Through extracurricular practice activities, students' understanding of society can be enhanced, their sense of social responsibility can be cultivated, their interest in learning and innovation can be improved, and their knowledge and skills can be better mastered.

### 3. Conclusion

“Irrigation and drainage engineering” is a core professional course of agricultural water conservancy engineering. The mastery degree of this course is of great significance for students to engage in related work of farmland and water conservancy engineering after graduation. In view of the current situation of the reform of colleges and universities in our country, this paper puts forward specific reform suggestions from the perspective of theoretical teaching and practical teaching. The purpose is to improve the students' interest and efficiency of learning, strengthen the theoretical training and practical training of agricultural water conservancy professionals, so as to cultivate qualified agricultural water conservancy professionals who meet the needs of social development.

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