

# The Curriculum Construction Planning and Measures of Environmental Ecological Engineering Specialty

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**Abstract:** Curriculum construction is one of the important contents of school teaching capital construction, the foundation of specialty construction and discipline construction, and an important way to improve teaching quality. Design some suitable courses which based on their knowledge level, skill needs, and interests for learners; Then, teachers need to set teaching objectives for these courses to meet their expectations and requirements. Curriculum construction involves many aspects, such as educational ideas, teaching process, teaching methods and means, teaching staff, teaching management, teaching conditions and many other aspects. Curriculum construction directly reflects the teaching level of the school and directly affects the quality of personnel training. In order to further strengthen the teaching of environmental ecological engineering, standardize the course management and improve the teaching quality, the following plans are made for the course construction of environmental ecological engineering specialty in the five year which was from 2020 to 2025, and corresponding measures are formulated.

**Keyword:** Curriculum construction; Planning and measures; Environmental Ecological engineering; Specialty

## 1. Introduction

The guiding ideology of curriculum construction. Adhere to the educational orientation of "Education must serve the national modernization construction and the people, and must be combined with production labor and social practice to cultivate national builders and successors with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor", implement the spirit of "Opinions on Further

Strengthening Undergraduate Teaching in Colleges and Universities" issued by the Ministry of Education, set up a new concept of education, talents and Scientific Outlook on Development in the 21st century, take "accelerating development, improving quality and creating characteristics" as the basic idea, and promote the coordinated development of students' knowledge, ability and quality as the basic requirement, vigorously strengthen curriculum construction, and build and cultivate modern high-quality talents.

## 2. Research Methods

### 2.1 Action Research Method

This is the main method of curriculum implementation. Action research refers to teachers encountering problems in educational and teaching practice, using them as the starting point for curriculum reform [1], under the guidance of educational theory experts and experienced educators, using various methods in a planned and step-by-step manner to explore and analyze the causes of problems, and through the design, planning, implementation, and evaluation of educational activities [2], addressing educational problems and improving educational goals.

### 2.2 Case Study Method

By analyzing specific cases of course implementation, reveal the process and effectiveness of course implementation. This method can help us gain a deeper understanding of the actual implementation of the course, identify problems, and propose improvement plans.

### 2.3 Survey Research Method

By conducting surveys on teachers and students, understand their attitudes and views on curriculum implementation. This method can collect a large amount of data and

information, providing strong basis for curriculum improvement.

## 2.4 Observation Method

This is a planned and purposeful perception and discovery of the psychological activities of teachers and students. Through observation, we can understand their actual performance in course implementation, identify problems, and propose improvement measures. The objectives and tasks of curriculum construction.

## 3. Research Results

### 3.1 Curriculum Objectives

Through five years' construction, a curriculum system is formed, which is conducive to the coordinated development of students' knowledge, ability and quality, with optimized structure and advanced content and can meet the needs of social development. According to the construction principle of "combining point with surface, focusing on construction, highlighting excellent products and paying attention to practical results", the course construction is divided into three levels: qualified courses, excellent courses and excellent courses [3]. Starting from the qualified course construction, the excellent course construction is the foundation, and the excellent course construction is the leader, and the course construction is carried out with goals, plans and priorities.

#### 3.1.1 Qualified courses

All courses that have been started for more than two rounds have completed the qualification assessment to ensure that the pass rate exceeds 96%.

#### 3.1.2 Excellent courses

Focus on the construction of six professional basic courses and professional courses with good basic conditions and wide benefits for students, and build about two courses each year.

#### 3.1.3 Excellent courses

Build two college-level quality courses, and build about one each year. Strive for one course to enter the ranks of provincial-level excellent courses.

### 3.2 Task of Curriculum Construction

#### 3.2.1 Construction of teaching staff

According to the needs of curriculum

construction, reasonably introduce talents, vigorously strengthen the construction of teaching staff [4], and ensure that there are at least two professors in this major, the proportion of teachers with associate senior titles or above is  $\geq 30\%$ , and the proportion of teachers with master's degrees or above under 45 is  $\geq 60\%$ . Build a teaching staff with reasonable structure, relatively stable personnel, high teaching level, good teaching effect and strong comprehensive quality. Encourage teachers with high academic level and rich teaching experience to preside over curriculum construction. The person in charge of each course construction should have a senior title in principle. At the same time, every course construction should have plans and measures to train young teachers, teaching backbones and academic leaders.

#### 3.2.2 Teaching material construction

Actively use the "21st Century-oriented Curriculum Textbooks", national planning textbooks, textbooks recommended by the professional teaching steering committees of the Ministry of Education, and excellent textbooks that have won national, provincial and ministerial awards. Pay attention to the selection of high-quality new textbooks published in recent three years. The use of high-level excellent textbooks published in the past three years accounts for more than 60% of the training plan courses [5].

Combined with the practice of curriculum construction in this major, teachers are strongly supported to write self-made teaching materials with high quality and distinctive characteristics that are suitable for the training objectives of this major [6]. Teachers are encouraged to apply for national and provincial textbooks, and will be given strong financial support for textbooks that have obtained such projects. Encourage the teaching materials of key courses and excellent courses to develop in the direction of multimedia three-dimensional teaching materials, so that the construction of teaching materials can reach a higher level.

#### 3.2.3 Construction of practical teaching conditions

Vigorously strengthen the construction of laboratories and practice bases, provide a strong guarantee for the smooth development of practical teaching [7], and promote the continuous improvement of practical teaching

quality. According to the needs of curriculum construction, gradually improve the construction of experimental center. We should actively promote the modernization of experimental teaching methods, and introduce advanced experimental teaching methods such as multimedia technology, simulation technology and network technology into practical teaching to improve the effect of experimental teaching. After five years of construction, the experimental center should be able to offer all the experiments required by undergraduate teaching, and design and comprehensive experimental projects, and the laboratory should be open to students. While perfecting the construction of experimental center, this major should establish at least two stable off-campus teaching practice bases.

#### 3.2.4 Construction of teaching content and curriculum system

The construction of teaching content and curriculum system is the core of curriculum construction. It is necessary to select classic teaching contents, delete outdated teaching contents and remove unnecessary repetition between course contents. Pay attention to the scientific, advanced and practical nature of knowledge, introduce the current scientific and technological development and the latest scientific and technological achievements of this discipline into classroom teaching, and update and improve the course teaching content. Pay attention to the cultivation of students' learning ability, thinking ability, practical ability and innovation ability in the teaching process [8]. In order to correctly handle the relationship between the construction of a single course and a series of courses, the optimization of the teaching content and structure of a single course should be subordinated to the overall optimization of the curriculum system, and a new curriculum system combining relative stability with dynamic renewal should be established; There should be a perfect course syllabus; It is necessary to strengthen the construction of examination database, promote the separation of teaching and examination, improve the course assessment links, improve the assessment methods, and increase the scientific and practical nature of course assessment.

#### 3.2.5 Construction of teaching methods and means

Guided by modern educational ideas, we should establish students' dominant position in teaching activities, emphasize the interaction between teachers and students, and fully mobilize students' enthusiasm, initiative and creativity. According to different teaching objectives, teaching contents and teaching objects, we should teach students in accordance with their aptitude, reform the traditional teaching methods of "cramming" and "cramming", and adopt lively teaching methods such as heuristic, discussion and case analysis to create good conditions for students' independent learning. The teaching of various courses should be based on the principle of improving teaching effect, constantly strengthen the modernization of teaching methods, actively promote the application of information technology in teaching activities, and encourage teachers to use multimedia scientifically and reasonably to achieve the best teaching effect. Excellent courses should be taught and managed through the Internet, and related teaching outlines, teaching plans, exercises, experimental guidance, and references should be online and open for free, so as to realize the sharing of high-quality teaching resources and promote the construction of other courses.

### 4. Analysis and Discussion

#### 4.1 Improvement and Optimization of Cheng Content

Learning effectiveness; Evaluate whether the course has achieved the expected teaching objectives, whether it is necessary to make further adjustments, discuss whether the update of course content is timely, and whether it reflects the latest disciplinary development and practical requirements; Analyze whether the course content is complete and systematic, and whether it can meet the learning needs of students; Explore whether the course content is suitable for the age, cognitive level, and interest characteristics of students.

#### 4.2 Innovation in Teaching Methods and Means

Evaluate whether the teaching methods used are effective, and whether they can stimulate students' interest and enthusiasm for learning; Discuss whether modern educational technology has been fully utilized, such as

multimedia teaching, online teaching, etc.; Analyze whether teaching methods are flexible and diverse, and whether they can adapt to the learning styles and needs of different students.

#### **4.3 Teaching Effectiveness and Evaluation**

Analyze the learning outcomes of students, including knowledge acquisition, skill improvement, attitude changes, etc.; Discuss whether the methods and standards for course evaluation are scientific and reasonable, and whether they can truly reflect the optimization of students.

#### **4.4 Teacher Development and Team Building**

Analyze the role and role of teachers in curriculum construction, and whether they have received sufficient support and training; Discuss the cooperation and collaboration among the teacher team, whether a good teaching and research atmosphere and team spirit have been formed; Explore how to further promote the professional development of teachers and improve the level and quality of curriculum construction.

#### **4.5 Resource Construction and Utilization**

Assess the richness and availability of course resources, such as textbooks, teaching materials, experimental equipment, etc.; Discuss the sharing and utilization of resources, and whether the maximization of resource utilization has been achieved; Analyze how to further explore and integrate resources to provide strong support for curriculum construction.

#### **4.6 Challenges and Issues**

Identify the main challenges and problems encountered in curriculum construction, such as insufficient teaching resources and outdated teaching methods; Analyze the causes and impacts of these challenges and issues, and propose corresponding solutions and improvement measures.

#### **4.7 Future Development Direction**

Explore the future development direction and goals of curriculum construction, such as strengthening the connection between curriculum and society, promoting curriculum internationalization, etc.; Analyze how to further innovate course content and teaching

methods, enhance the social influence and international competitiveness of the course; Discuss how to establish a long-term mechanism to ensure the sustainable development of curriculum construction.

### **5 Standards and Measures for Curriculum Construction**

#### **5.1 Curriculum Construction Standards**

##### **5.1.1 Qualified curriculum standards**

- (1) There is a syllabus that meets the teaching objectives of this course;
- (2) Meet the post qualifications (with teacher qualification certificate, new teachers should pass pre-job training);
- (3) Choose high-quality textbooks published in public, and arrange the teaching content and process reasonably;
- (4) The experiment rate reached more than 95% of the requirements of the syllabus, and comprehensive experiments or design experiments could be conducted;
- (5) Instructors can complete the teaching tasks of each teaching link in strict accordance with the requirements of the school and the department;
- (6) Teaching materials are complete (teaching weekly calendar, student attendance and usual homework register, test paper, test paper answer and grading standard, student experiment report, special homework);
- (7) The teaching effect is good, and the average score of students' evaluation is above 85.

##### **5.1.2 Excellent curriculum standards**

- (1) The course must pass the school-level qualification assessment and be offered for more than three years;
- (2) Teachers with reasonable structure, including associate professors who teach undergraduate courses, and 90% of young teachers under the age of 35 have graduate degrees;
- (3) Choose textbooks that have won awards at or above the provincial level, excellent textbooks oriented to the 21st century, textbooks with high recognized level or featured textbooks published publicly.
- (4) Teaching and research projects with school-level teaching achievements and projects;
- (5) There are multimedia courseware and network teaching courseware;

(6) Open all the experiments required by the syllabus, and has high quality comprehensive and designed experiments, the experimental effect is good, and the laboratory can be open to students;

(7) The course assessment management is strict and standardized, with high-quality examination questions and reasonable grading standards. Unified proposition, unified examination, unified grading standard and unified marking are carried out in the general courses set by the college;

(8) The teaching materials are kept intact and standardized;

(9) The teaching effect is good, and the average score of students' evaluation is above 90%.

### 5.1.3 Quality curriculum standards

(1) It is a key course at the school level;

(2) The course is lectured by professors and associate professors with high academic attainments and rich teaching experience, and has a teaching team with reasonable structure, stable personnel, high teaching level, strong scientific research ability and good teaching effect. 100% of young teachers under the age of 35 have graduate degrees;

(3) Pay attention to the scientific and rational use of modern educational technology to make high-quality multimedia courseware and course websites, and the teaching effect is good;

(4) It has achieved remarkable results in the reform of curriculum content and curriculum system, formed its own curriculum characteristics, won awards above the first prize at the school level, and published teaching research papers;

(5) Have good experimental conditions, set up innovative experimental projects, and have a wide range of laboratory opening;

(6) Teachers have strong scientific research ability and accept undergraduates to participate in their own scientific research activities;

(7) The teaching effect is excellent, and the average score of students' evaluation is above 90%.

## 5.2 Measures to Implement Curriculum Construction Planning

(1) We must improve our understanding of the importance of curriculum construction and increase the intensity of curriculum

construction; With reference to these provisions, the curriculum construction plan shall be formulated, and the curriculum construction plan shall be formulated for the approved courses, and practical measures shall be taken to ensure the realization of the curriculum construction objectives.

(2) Establish a curriculum evaluation system. Formulate detailed curriculum construction principles and evaluation standards, and the Academic Affairs Office will organize a curriculum evaluation every one to two years. Each application course is evaluated by the school expert group. Courses that pass the evaluation will be awarded certificates by the school, and the evaluation results will be notified in the school.

(3) The course compliance rate is one of the necessary conditions for participating in teaching evaluation.

(4) The curriculum construction projects shall be declared step by step according to the curriculum construction standards, and the courses must pass the evaluation of the corresponding grades before they can be declared for the higher-level curriculum construction projects. The construction period of the project course is generally not more than 2 years.

(5) The implementation of project management of curriculum construction. Give special funds for the construction of excellent courses and excellent courses.

(6) The implementation of mid-term inspection of curriculum construction, the inspection found that failed to implement the project according to the curriculum construction plan, to be informed criticism, and terminate the use of project funds.

(7) Every two years, we should organize a self-examination, review and evaluate the excellent courses and excellent courses evaluated in the last round, and conduct spot checks on qualified courses at a rate of not less than 20%. The results of spot check and review should be attributed to the curriculum construction files and reported to the Academic Affairs Office for the record.

## 6. Course Construction Effects

Implementation effect of curriculum construction:

After a period of active efforts and practical exploration, the course construction has

achieved significant results, laying a solid foundation for improving teaching quality and promoting the comprehensive development of students. The conclusion is summarized as follows:

### **6.1 The Course Content has been Comprehensively Optimized and Updated**

This course construction has comprehensively sorted and updated the course content, ensuring that it not only meets the latest requirements of subject development, but also meets the learning needs and interests of students. At the same time, the course content emphasizes the combination of theory and practice, effectively enhancing students' practical abilities and innovative spirit.

### **6.2 Innovative Breakthroughs in Teaching Methods and Means**

In the course construction, we actively tried and adopted various innovative and effective teaching methods, such as case teaching, project-based learning, flipped classroom, etc., which fully stimulated students' interest and enthusiasm in learning. At the same time, we have also made full use of modern educational technology, such as multimedia teaching, online teaching, etc., to improve teaching effectiveness and learning experience.

### **6.3 Significant Improvement in Teaching Effectiveness**

Through this course construction, the learning effectiveness of students has been significantly improved. Not only has the mastery of knowledge become more solid, but the skill level has also been significantly improved. At the same time, students' learning attitudes and methods have also significantly improved, laying a solid foundation for their future development.

### **6.4 The Quality of the Teaching Team has been Significantly Improved**

In the process of curriculum construction, the teacher team actively participates and cooperates, which not only enhances their professional literacy and teaching ability, but also forms a good teaching and research atmosphere and team spirit. This provides strong support for the sustainable development of curriculum construction in the future.

### **6.5 Resource Construction has been Strengthened**

This course construction focuses on the integration and utilization of resources [9], not only fully utilizing existing resources, but also actively exploring and introducing new resources. This provides strong support for the smooth implementation of course teaching [10].

In summary, the course construction has achieved significant results, but there are also some shortcomings and areas that need improvement. We will continue to work hard to continuously improve and optimize course content, teaching methods and means, and make greater contributions to improving teaching quality and promoting the comprehensive development of students.

## **7. Conclusions**

The curriculum construction plays a vital role in educational innovation and development. As an important part of educational innovation, curriculum construction needs to continuously lead the direction and path of educational innovation, improve the quality of education, and promote the realization of educational equity by deepening curriculum reform and expanding curriculum resources. In this process, curriculum builders need to pay attention to students' learning needs and development potential, and pay attention to cultivating students' critical thinking, innovation ability and practical ability, so as to cultivate high-quality talents who can meet the needs of future social development. They also need to maintain close cooperation with industry and all sectors of society, pay attention to the development trend of education internationalization, and inject new impetus into education innovation and development. In the future development, curriculum builders need to continue to innovate, pursue excellence, and contribute to the cultivation of high-quality talents to meet the needs of future social development.

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