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Research on Teaching Reform of "Urban and Rural Ecology and Environmental Planning" Course

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Abstract: "Urban and Rural Ecology and Environmental Planning" is a core course for senior undergraduate students majoring in urban and rural planning. Addressing issues such as low student interest, outdated theoretical content, and insufficient practical teaching in the course, the author proposes teaching reform methods such as improving teaching methods, introducing cutting-edge theories, and increasing the proportion of practical teaching hours, aiming to enhance students' learning interest and effectiveness, and cultivate professionals who can analyze and solve practical urban and rural planning issues using ecological theories and methods.

Keywords: Urban and Rural Ecology and Environmental Planning; Urban and Rural Planning; Teaching Reform

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"Urban and Rural Ecology and Environmental Planning" is a course that studies the relationship between urban human activities and the surrounding environment using principles and methods of ecology and urban science. Through this course, students can learn how to apply the basic principles of ecology, combine national economic development, ecological environment protection, and rational resource development and utilization, participate in the research and decision-making of regional development strategies and long-term urban planning, propose reasonable development strategies, as well as measures for ecological environment construction, rational resource utilization, and sustainable environmental development.

"Urban and Rural Ecology and Environmental Planning" is a core course for senior undergraduate students majoring in urban and rural planning at the author's university, with 64 class hours, including 56 hours of theory and 8 hours of practice. This course is not only an important link for students to transition from theoretical learning to practical application of ecology but also a crucial step for students to develop comprehensive thinking from junior to senior levels.

1. Current Teaching Situation

1.1 Low Student Interest

Theoretical classes are often one-way communication where teachers deliver content and students passively listen, leading to a lackluster classroom atmosphere and difficulty in sparking students' interest in learning. The text-based nature of theoretical knowledge makes learning dull for students. Lack of interest in theoretical classes results in widespread absenteeism, which hinders the development of theoretical courses in the undergraduate stage of urban and rural planning education.

1.2 Outdated Theoretical Content

Recommended textbooks for the course "Urban and Rural Ecology and Environmental Planning" include: "Urban Ecology Planning" edited by Yang Zhifeng, published by Beijing Normal University; "Urban Ecological Environment Science" edited by

Yang Shihong, published by Science Press; "Urban Ecology and Urban Environment"[1] edited by Shen Qingji, published by Tongji University Press; "Urban Ecology and Environment: Principles, Methods, and Optimization"[2] edited by Shen Qingji, published by China Architecture & Building Press; "Urban Ecological Planning Methods and Applications"[3] edited by Shi Tiemao, published by China Architecture & Building Press. These textbooks are outdated, with many examples from around 2000, making them irrelevant to the knowledge needs of contemporary university students.

1.3 Insufficient Practical Teaching Components

Practical teaching aims to cultivate students' hands-on abilities, observational skills, problem analysis and solving capabilities, as well as a spirit of scientific inquiry and innovation. The key aspect of this course is to enable students to apply theoretical methods of ecology and urban science in ecological planning design and environmental problem-solving. However, the current practical course only consists of 8 hours, which is inadequate for guiding students to conduct in-depth course designs. Therefore, the teaching effectiveness is not ideal.

2. Teaching Reform Methods

2.1 Improve Teaching Methods to Enhance Student Interest

In theoretical classes, teachers should make full use of multimedia resources, play videos moderately, introduce classic domestic and international case studies, and use diverse teaching methods like questioning and discussion to engage students in critical thinking and stimulate their interest. By deepening students' understanding of urban ecosystem characteristics, existing problems, and solutions through topics such as the composition and functions of urban ecosystems, urban populations, ecological environments, urban disasters and prevention, and urban landscape ecology, a course that integrates theory and practice will provide students with visual impact and align with their learning preferences, enhancing their comprehension based on sensory cognition.

2.2 Introduce Cutting-Edge Theories to Keep Pace with the Times

To maintain the timeliness and practicality of the course content, it is also necessary to update the teaching materials in a timely manner by searching for information online, paying attention to urban development and related news, and incorporating new developments in the field of urban ecology. It is recommended to organize the teaching around hot topics such as rural revitalization, carbon peaking and neutrality, and park cities.

Efforts in reducing carbon dioxide emissions aim to peak before 2030 and strive for carbon neutrality by 2060, as pledged by China at the 75th session of the United Nations General Assembly. Integrating knowledge on low-carbon practices into the curriculum, teaching low-carbon city planning and design theories and methods, and guiding students in low-carbon planning and design are essential pathways.

2.3 Increase Practical Teaching Hours to Enhance Practical Skills

The adjusted course now comprises a total of 64 hours, including 40 theory hours and 24 practical hours. Practical teaching is divided into two main parts: conducting investigations and analyses of specific ecosystems in groups and engaging in ecological planning and design as group projects. Each group selects a theme such as ecological park planning and design, low-carbon residential area renovation design, low-carbon campus renovation design, or infrastructure ecological planning, and chooses a site for research and analysis to execute the ecological planning and design process.

Practical teaching can fully stimulate students' enthusiasm for learning and thinking, enhance communication among students, deepen students' understanding of professional knowledge points, and greatly improve students' software operation and drawing abilities. This lays a good foundation for future graduation design projects and project undertakings.

3. Content and Results of Practical Teaching

3.1 Ecological System Investigation

Guiding students to conduct investigations and analysis of the ecological systems on their university campus. The university campus, located in urban centers, is a relatively independent complex ecological system and a subsystem of the urban ecological system. The natural and social factors of the campus form a unique ecological system with a certain morphological structure and interrelationships. The coordinated development of various elements collectively determines the health status of the urban campus ecological system.

In the course of teaching, practical teaching activities need to be carried out through the investigation and analysis of the campus ecological system to understand the complexity of urban ecological systems and the interrelationships and coordinative effects among various ecological elements. Analyzing the investigation results of the campus ecological system's components helps to understand the

structure of the campus ecological system and the interactions among various ecological elements, thus enhancing the understanding of urban ecological systems.

3.2 Ecological Planning and Design

Ecological planning and design require comprehensive thinking skills in urban planning and design to effectively address real issues in urban ecological environments from social, cultural, economic, and other integrated perspectives.[4]

Students can choose a theme from ecological park planning and design, low-carbon residential area renovation design, low-carbon campus renovation design, infrastructure ecological planning, etc., and select a site for research and analysis before carrying out ecological planning and design.

For instance, in the case of low-carbon residential area renovation design, choosing an old residential area with issues such as poor building lighting, inadequate thermal insulation, serious rainwater runoff, insufficient green space, and aging infrastructure. Strategies such as utilizing solar energy, renovating buildings, adding rooftop gardens, rain gardens, and green public facilities are proposed for the renovation design.

4. Conclusion

"Urban and Rural Ecology and Environmental Planning" is an applied discipline aimed at alleviating and improving urban and rural ecological environmental issues. It differs significantly from purely theoretical courses, requiring continuous improvement and updates in its teaching system. Based on the author's years of frontline teaching experience and profound reflections, with the goal of addressing current teaching issues, this paper analyzes the current teaching problems of the course, proposes teaching reform methods, aims to provide reference for teaching this course in sister schools, and hopes to overcome the limitations of traditional classroom teaching, nurturing students' ability to transform from initial intuitive design into comprehensive thinking analysis, thereby improving teaching quality.

References:

[1] Shen Qingji, et al. Urban Ecology and Urban Environment. Shanghai: Tongji University Press, 1998.

[2] Shen Qingji, et al. Urban Ecology Environment: Principles, Methods, and Optimization. Beijing: China Architecture & Building Press, 2011.

[3] Shi Tiemao, et al. Urban Ecological Planning Methods and Applications. Beijing: China Architecture & Building Press, 2018.

[4] Sun Shiwen, Reflections on Urban and Rural Planning Education. City Architecture, 2017(30):14-16.

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