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"Installation Engineering Evaluation" Curriculum innovation and entrepreneurship education and teaching design

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Abstract: This paper is based on the background of double gen, combining with the installation engineering valuation course characteristics, on the basis of adhere to the "five education simultaneously", around the professional talent training objectives, combined with the teaching content, formulate course double gen education teaching objectives, and the content module into the double gen elements, around students individual reach low component index system analysis, Analyze the existing reasons from the aspects of students' attitudes, learning habits, learning methods and other aspects, provide personalized guidance to students, guide students to enhance the spirit of innovation, establish entrepreneurial awareness, and improve the ability of innovation and entrepreneurship.

Keywords: Installation and valuation; Flipped classroom; Mass innovation.

1. Introduction

The installation engineering valuation course is the core course of engineering cost professional, is the basic concept of installation valuation, basic principle and calculation rules, combined with the installation design specification of water supply and drainage engineering, electrical engineering, heating engineering, fire engineering, ventilation and air conditioning engineering comprehensive application course, a total of 48 hours, 3 credits, including 30 hours, training 18 hours.

Through the study of this course, Make students familiar with the building water and electricity heating, ventilation and air conditioning, brush oil anticorrosion drawings reading, Familiar with the application of installation budget quota and list valuation specification, And learn to use the theoretical knowledge learned to analyze and solve various problems in the practical system, Master the basic theory, calculation method, calculation basic principle and calculation rules of installation valuation, Have the theoretical knowledge and basic skills of the installation and valuation of water supply and drainage engineering, electrical engineering, heating engineering, fire protection engineering, ventilation and air conditioning engineering, Be able to apply theoretical knowledge of installation pricing, Analyze and solve the practical problems of installation valuation faced by enterprises, Lay the foundation for installation and valuation, project management, design and construction, etc.

2. Teaching objectives of curriculum entrepreneurship and innovation education

This course focuses on the training objectives of engineering cost professionals, combines the teaching content, and achieves the following teaching objectives in innovation and entrepreneurship education:

(1) Combine the teaching content of learning and design elements of the basic theory of installation and valuation, excavate the elements of family feelings, social responsibility, integrity quality and professional dedication, and cultivate the mission of innovation and entrepreneurship according to law;

(2) Combining the teaching content such as installation quota and installation design specification, explore the elements of mass entrepreneurship and innovation, strengthen professional quality, and enhance the spirit of innovation, entrepreneurial consciousness and professional skills;

(3) On the basis of mastering the calculation rules, carry out water supply and drainage engineering, electrical engineering, heating engineering, fire engineering, ventilation and air conditioning engineering calculation and other teaching contents, excavate the fighting spirit, cooperation spirit, competitive consciousness and other elements, establish the sense of rules, and shape the will and spirit of tenacious struggle, unity and cooperation;

(4) On the basis of systematic learning of installation and pricing, excavate elements such as aesthetic accomplishment, artistic accomplishment and cultural creativity to stimulate students' innovative inspiration and creative vitality;

(5) Combined with engineering cases and other teaching contents, mining the labor spirit, craftsman spirit, creative spirit and other elements, to improve the innovation and entrepreneurship spirit and practical ability.

3. Mass entrepreneurship and innovation elements in the course knowledge

(1) Module 1: Overview of the cost of construction and installation works: Type of quota and valuation basis of installation project

Using the method of group discussion, based on: "Shandong Province Installation Project Price List (2020)", "Construction Engineering Bill of Quantity Valuation Code" GB50500-2013, "Shandong Province Installation Project Consumption Quota" SD02-31-2016, the calculation rules of the installation price in the case are discussed in class. These

case knowledges contain the splendid civilization of the Chinese nation, the innovative spirit of being the first, so that students have a strong national pride, cultivate students' feelings of home and country.

(2) Module 2: Specification for the calculation of general installation engineering quantities and related quota valuation

Construction and installation project cost consists of direct costs, indirect costs, profits and taxes. It includes all the costs incurred from the construction of the project to the completion of the acceptance. In view of this part of the content, through the broadcast of videos, the students can enjoy the light show, introduce the visual art, and use the method of contrast to explain the similarities and differences of vision and visual perception, so that the students can deeply understand the importance of integrity and cooperation spirit.

(3) Module 3: Electrical equipment installation engineering

According to the basic knowledge of electrical equipment engineering, the natural light application case of Real Goods solar energy life center was discussed, and the concept of environmental protection and energy saving was introduced, so that students can feel the power of science and technology, and stimulate students' national pride and strong patriotic responsibility. Cultivate students to have industrious and brave, courage to take responsibility, fear life, love labor, scientific ethics of excellent personal character. Taking the stage lighting design of "Great Journey" on the 100th anniversary of the founding of the Party as an example, it tells the basic principles of lighting design, integrates professional knowledge into practical cases, improves students' artistic accomplishment, and cultivates the spirit of innovation and the quality of entrepreneurship and innovation.

(4) Module 4: Fire protection engineering

Introducing the famous buildings of the School of Art, Architecture and Design of the University of Monterey, analyze and discuss how to introduce fire protection to a greater extent in architectural design and modeling, so as to realize the perfect combination of function and beauty. The School of Art, Architecture and Design at the University of Monterey, Mexico, is Ando's first project in Latin America. He designed the university building as a shell-shaped, with ridges and folds, and the building has a stepped hyperbolic entrance with six floors of reinforced concrete slabs around natural light Wells, interspersed with straight and curved staircases. The design of the exposed concrete makes the light in the amphitheater inside the building particularly bright, and the sunlight penetrating through the gaps creates a spectacular landscape. Through the detailed explanation of the case. For this part in Shenzhen peace international financial center fire engineering as the research object, group discussion, through the fire hydrant and automatic fire extinguishing system two levels, analyzes the characteristics of the firefighting, and the introduction of environmental protection and energy saving concept, let students feel the power of science and technology at the same time, inspire students' feelings, innovative spirit and creative spirit.

(5) Module 5: water supply and drainage installation works

Mainly using the consumption quota "the 10 volume of water supply and drainage, heating, gas engineering" chapter four water supply and drainage pipe installation, suitable for indoor and outdoor living water supply, drainage, rainwater pipe installation, a total of 289 sub-items. The pipe installation quota includes the installation of pipe and pipe fittings, hydraulic test and disinfection flushing (drainage pipe is irrigation test); indoor pipe (except indoor cast iron water pipe and DN 200 drainage pipe) has included the pipe card (block), support hook, pipe support bracket and rust removal paint (anti-rust paint and silver powder). If the above two types of pipes and outdoor water supply pipes need to be supported (hanging) frame, it can be calculated according to the first chapter of this book quota. For this part of the content, the flipped classroom teaching mode, before task push, the group PBL cooperation, collect material and pipe, pipe fittings, sanitary equipment, water supply and drainage equipment calculation rules, let the student in learning professional knowledge at the same time, cultivate students of science and technology patriotic labor feelings and bear hardships and stand hard work.

(6) Module 6: heating project

The heating quota is applicable to the domestic heating heat source pipeline, air conditioning water system pipeline, accessories, appliance installation, small container production and installation, etc. in the new construction, expansion and overall renovation projects. All kinds of pipe installation projects have included the corresponding installation of the quota pipe fittings, and the quantity of various pipe fittings has been determined comprehensively (see the appendix of the quota for details), and it is generally not adjusted during use. If it is really necessary to adjust, only the amount of pipe fittings shall be adjusted, and the rest shall remain unchanged. In view of this part, through the case explanation of Hetang Jingyuan heating project, to discuss, to improve students' cultural creativity.

The teacher’s guide the students around the " how to choose the different lights in the work area and the leisure area in the office space? “Discuss, explore the reasons, find out the measures, cultivate students 'professional quality at the same time, stimulate students' innovative thinking and innovative spirit.

(7) Module 7: ventilation and air conditioning engineering

The construction drawing of ventilation and air conditioning engineering consists of construction drawings, construction drawing budget, design description, equipment material table and review minutes, etc. Shandong province installation engineering quantity consumption quota volume 7 "ventilation and air conditioning engineering" (hereinafter referred to as quota), divided into 13 parts 633 quota sub-items. In view of this part, the method of case analysis and group discussion is adopted. In the specific survey projects, students can survey the central air conditioning design characteristics of the three pedestrian streets in Jinan, so as to cultivate students' entrepreneurial consciousness and cooperation spirit.

The relevant content of "Internet + Design" is introduced in the course to guide students to actively explore and comprehend the aesthetic thoughts and national spirit contained in the design, and carry out new media innovative design, which is conducive to integrating the three aspects of value shaping, knowledge transmission and ability cultivation, and improve students' humanistic quality.

4. Reform and innovation

Teachers make a comprehensive analysis of the sub-indicators with low achievement degree, write teaching reflections from the aspects of teaching objective design, teaching method use, teaching environment creation, teaching activity organization, students' learning situation, optimize the teaching design, continuously improve teaching, and improve the teaching quality of courses.

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