

Curriculum Standard

Curriculum: Building Information Modeling(BIM) in
Civil Engineering Costing Practice

Major: Engineering Cost

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Credit: 4.5

Class Hour:88

Major: Engineering Cost

1. Preface

1.1 Position definition

Building Information Modeling(BIM) in Civil Engineering Costing is a compulsory course in the specialty of Engineering Cost. Before studying this course, prior courses in Construction Project Valuation (I~II) and Engineering Tendering and Contract Management are required. And in the next sequence students should participate in Graduate Design. Through the study of this course, students should be able to comprehend the work flow of the tender control price costing systematically, and grasp the basic theories and methods of Engineering Cost, during which the capacity of image recognition in construction documentation, quantities calculation, compilation for bills of quantities and item pricing should be developed to match the requirement as cost estimators.

1.2 Instructional design

Guided by vocational activities, the curriculum teaching content of "knowledge, skills and quality" is created around vocational functions and comprehensive vocational abilities. Through the analysis of the professional ability required by the post of cost engineer, the knowledge, skills and attitude required by the post are determined, and then the course content is organized. It enables students to use cost software to analyze and solve practical problems and realize the training goal of "professional knowledge, post skills and professional quality" featured in higher vocational education, which reflects the reform thought of "three to one" (competency based, vocational function as the main line, project as the node, modular) specialized curriculum.

Project teaching, task-driven and other operational teaching methods are adopted. The course is designed according to the work flow of cost staff and practical activities, giving full play to the main role of students in task-driven, emphasizing students' self-skill practice, requiring students to select topics and establish courses in practice as a group or to complete tasks according to the requirements of given actual enterprise projects.

To establish an evaluation system based on the evaluation of unit courses with the goal of ability evaluation. The method of "students, groups, teachers and enterprises" is adopted in the

course evaluation, and comprehensive evaluation is carried out from many aspects such as knowledge, professional ability, core ability and professional accomplishment. Through the reform of course assessment, students' interest in learning will be enhanced and their initiative and enthusiasm in learning will be greatly brought into play.

2. The Targets of course

2.1 Overall Target

The teaching of this course is centered on cultivating the professional job quality and skills of marketing students, adhering to the basic theory of "necessary and sufficient", paying attention to the training of students' corresponding vocational skills, adopting various teaching methods and means, combining in-class learning, in-class operation and extracurricular practice, giving students more opportunities to practice, improving students' ability to analyze market data, deal with problems, marketing combination planning and execution ability, marketing control and management ability, Basic marketing and sales management charting skills and operational skills, training and improve students correctly analyze and solve marketing and sales management-related problems of practical ability, so that students can better grasp the basic skills of business data analysis and processing, improve professional and technical quality, better serve the socialist market economy construction.

2.2 Specific Target

Through the study of this course, students should understand the engineering cost workflow, understand the principle of engineering measurement and valuation, master the method of construction engineering measurement and valuation and the operation of related software, and have the ability to prepare bidding control price.

2.2.1 Ability

- (1) Familiar with the common methods of construction drawing budgeting;
- (2) Familiar with the classification, scope of application, adjustment and use of budget quota;
- (3) Familiar with the scope of application and use of construction and installation cost quota;
- (4) Familiar with the collection and use of engineering cost information;
- (5) Be able to master the compilation method of bidding base price of construction and installation bill of quantities;
- (6) Able to master the compilation method of bidding quotation of construction and installation bill of quantities;
- (7) The application of modeling calculation and civil engineering software.

2.2.2 Knowledge

- (1) Familiar with construction engineering and legends of common building materials;
- (2) Can master the calculation of construction engineering quantity;
- (3) Familiar with the content and format of bill of quantities;
- (4) Be able to master the compilation of the bill of quantities of construction projects;
- (5) Be familiar with the compilation of the list of construction measures;
- (6) Be familiar with the compilation of other projects and sporadic work project lists;
- (7) Able to master the preparation of bidding control price and bidding quotation;
- (8) Can be familiar with bid evaluation methods, will determine the winning bid.

2.2.3 Characteristics

- (1) Promote the spirit of being realistic, meticulous and striving for perfection;
- (2) Develop the quality of honesty, diligence, good communication and cooperation;
- (3) Establish a comprehensive, cooperative and unity consciousness, for the development of professional ability to lay a good foundation.

3. Content and Demand

Serial Number	Tasks	Subject Introduction	Event Design	hour
1	Item 1: Drawing and modeling of engineering main components	Content: Drawing and modeling of engineering main components Knowledge Requirements: (1) Master the basic engineering Settings (2) Master axis net drawing (3) Master the drawing and modeling of concrete column, wall, beam and plate main structural components (4) Master the drawing modeling of masonry, doors and Windows, room decoration and other architectural components	1) Enter the validity audit of the data 2) A typical use case study of the name 3) Screening of the information form of the examination applicants 4) The production of a company's management expense dynamic chart	20
2	Item 2: Preparation of bidding control price	Content: Preparation of bidding control price Skills Requirements: Be able to calculate the quantity of partial project and measure project Knowledge Requirements: (1) Master the preliminary preparation of modeling (2) Master the CAD drawing modeling of the main structure of the first floor column, beam and plate (3) Master the CAD drawing modeling of the first floor masonry, doors and Windows, room decoration and other	1) Helibo company's goods order form production 2) Electronic version of the production of travel expenses reimbursement documents	28

		architectural components (4) Master the structure and building modeling above the second floor (5) Master the modeling of foundation, stairs, building area, water discharge, steps, awning, bay window and other sporadic nodes (6) Master modeling skills such as practice, fast modeling, engineering quantity summary and quantity checking		
3	Item 3: Preparation of bidding control price	Content: Preparation of bidding control price Skills Requirements: Ability to prepare construction and installation project cost documents as required Knowledge Requirements: Understand the whole process of cost preparation Master the composition of budget documents	The SUMPRODUCT function is used to summarize the company's sales records A summary of sales data for a product dynamic update region	20
4	Item 4: Comprehensive practice: the preparation of tender offer and the determination of the winning bid price	Content: The preparation of tender offer and the determination of the winning bid price Skills Requirements: (1) Have the ability to prepare bidding documents (2) Have the ability of bid evaluation and preparation of bid evaluation report Knowledge Requirements: (1) Be familiar with the format of bidding documents (2) Study the evaluation methods and carry out bidding quotation (3) Simulate bid opening and record bid opening will be made (4) Set up bid evaluation committee	1) Use pivot tables to filter sales data 2) ShunDa Computer Company sales costs pivot table editing	20

		(5) Master the calculation of business bid score (6) Master the bid evaluation method, will prepare the bid evaluation report, determine the winning candidate.		
Total				88

4. Feasible suggestion

4.1 Selection and Complied Suggestion of Coursebook

4.1.1 Selection Coursebook

The teaching materials and related resources for this course are jointly developed by professional teachers and enterprise personnel. The main resources are: teaching materials, courseware, handouts, teaching plans and course websites. Teaching materials should fully reflect task-oriented and practice-oriented curriculum design ideas.

4.1.2 Complied Suggestion of Coursebook

Professional activities should be divided into a number of typical work projects, according to the needs of the completion of work projects and post operation rules, combined with the requirements of vocational skills examination of the organization of teaching materials. It is necessary to introduce necessary theoretical knowledge, strengthen operation training and emphasize the application of theory in practice through typical construction engineering examples.

Teaching materials should be illustrated and combined with charts to improve students' intuitiveness and initiative in learning and deepen their knowledge and understanding of building products. Textbook expression must be refined, accurate and scientific.

The content of the teaching material should reflect the advanced, universal and practical nature, and the new technology, new technology and new equipment should be timely incorporated into the teaching material, so as to make the teaching material more close to the development and practical needs of the major.

The content of activity design in teaching material should be concrete and operable.

4.2 Suggestions for Teaching

(1) Take the work process of bidding control price preparation as the main line, take the work task as the orientation, and arrange teaching by connecting the major knowledge and skill points through the real project of the enterprise;

(2) Group teaching method is adopted to implement various tasks, and attention should be paid to grouping students of different types into groups to cultivate students' teamwork spirit;

(3) Build a platform for schools and enterprises to participate in classroom teaching, use Internet + to evaluate and display students' learning achievements, bring enterprise experts into the teaching platform, and educate talents jointly by schools and enterprises;

(4) Integrate the relevant contents of the national professional qualification certificate, such as grade II Cost engineer, 1+X Building Information Modeling (BIM), into the teaching content of the course.

4.3 Suggestion on Teaching Examines and Assessments

(1) Reform the traditional means and methods of student evaluation, adopt stage evaluation, target evaluation, project evaluation, theory and practice integrated evaluation model.

(2) Pay attention to the diversity of evaluation, and evaluate students' scores comprehensively by combining classroom questions, students' homework, daily tests, experiments and training, skills competitions and examinations.

(3) Attention should be paid to the assessment of students' practical ability and ability to analyze and solve problems in practice. Special encouragement should be given to students who have innovation in learning and application. Students' ability should be evaluated comprehensively.

4.4 Development and Utilization of Curriculum Resources

(1) Pay attention to the development and application of training instructions and teaching materials.

(2) Pay attention to the development and utilization of curriculum resources and modern teaching resources, these resources are conducive to the creation of vivid working situation, stimulate students' interest in learning, promote students' understanding and mastery of knowledge. At the same time, it is suggested to strengthen the development of curriculum resources, establish the database of multimedia curriculum resources, and strive to realize the sharing of multimedia resources across schools, so as to improve the utilization efficiency of curriculum resources.

(3) Actively develop and utilize network course resources, make full use of network information resources such as electronic books, electronic journals, databases, digital libraries, educational websites and electronic forums, so as to transform teaching from single media to multiple media; Teaching activities change from one-way transmission of information to two-way exchange; Students are moving from solitary learning to cooperative learning. At the same time, we should actively create conditions to build a distance teaching platform and expand the interactive space of course resources.

(4) Industry-university cooperation to develop experimental and practical training course resources, make full use of typical enterprise resources in the industry, strengthen industry-university cooperation, establish practice and practical training bases, practice and study alternately, meet the needs of students' practice and training, and create opportunities for students' employment.

(5) Establish this major and open the training center to enable it to have the functions of on-site teaching, experimental training and vocational skill verification, so as to realize the integration of teaching and practical training, teaching and training, teaching and textual research, and meet the requirements of students' comprehensive vocational ability cultivation.

4.5 Other instructions

(1) Pay attention to the construction of situational cost practice training environment, including the use of hardware scene environment and related case library.

(2) Pay attention to the development and utilization of course resources and modern teaching resources, actively develop and use network course resources, stimulate students' interest in learning, make students' learning is no longer limited to the classroom, promote students' understanding and mastery of knowledge.

(3) Industry-university cooperation to develop practical training course resources, make full

use of typical enterprise resources in the industry, strengthen industry-university cooperation, establish practice and training bases, practice and study alternately, meet the needs of students' practice and training, and create opportunities for students' employment

