Undergraduate Talent Cultivation Program for Cost Engineering

(Version: V2024)

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Discipline Leader & Program Director: Professor Chen Liwen

I. Basic Information of the Program

College: School of Architecture and Civil Engineering	**Industry College: School of Construction Management and Digital Intelligence**
Discipline Category: Management	**Professional Category: Management Science and Engineering**
Programme Name: Cost Engineering	**Programme Code: 120105**
Duration: Four Years	**Degree Conferred: Bachelor of Engineering**
Total Credits (China System): 166	**Total Teaching Hours: 2896**
ECTS: 198	**Total ECTS Hours: 5544**

II. Program Objectives

This programme aims to cultivate high-caliber application-oriented professionals with sound ethics, strong competencies, and a global mindset, capable of contributing to the modernization of the construction industry., all-round development of morality, intelligence, physique, beauty and labor, carrying out the framework of Four-Education and Four-Achievement (four educations: ideological and political education, general education, professional education, innovation and entrepreneurship education; four achievements: adult education, growth education, talent education, success education) learning activities, mastering basic knowledge in civil engineering technology, management, economics, law, and information systems related to Cost Engineering, and receive training equivalent to that of registered professional engineers. Graduates will possess strong capabilities in full lifecycle cost management of construction projects, practical and innovative abilities, teamwork skills, proficiency in applying information technologies (such as BIM) to solve professional problems, innovative and entrepreneurial mindsets, systems thinking abilities, good international perspectives, and cross-cultural communication, collaboration, and competition skills. They will be able to work in full lifecycle cost management across the engineering construction industry, and become high-quality applied talents embodying the program's distinctive "Five Excellence" traits (five excellent traits: good morality, strong academic ability, proficient theory, diligent practice, internationalization).

1. Graduation Requirements

(1) Engineering Knowledge: Ability to apply mathematical, natural scientific, engineering fundamental, and professional knowledge to solve complex engineering problems in Cost Engineering and related fields.

The requirement can be interpreted from the following perspectives:

Graduates should master mathematical and natural scientific knowledge and apply it to solve complex problems in Cost Engineering and related fields; master engineering basic knowledge such as engineering drawing, engineering mechanics and structures, building materials, and reading of concrete structure and interpretation of standard reinforced concrete detailing drawings, and apply it to solve complex problems in Cost Engineering and related fields; be familiar with laws and regulations such as the Code for Valuation with *Bill of Quantities of Construction Projects*, *Tendering and Bidding Law*, and *Civil Code (Contract Volume)*, and be able to prepare bidding documents and review contract clauses in compliance with regulations. Graduates should possess a foundation in engineering economics, be able to use tools such as present value analysis, internal rate of return (IRR), and net present value (NPV) for project investment feasibility analysis, and solve complex engineering problems such as engineering decision analysis, construction cost control, and overall cost optimization based on professional knowledge.

(2) Problem Analysis: Ability to apply basic principles of mathematics, natural sciences, and engineering sciences to identify, express, and analyze complex engineering problems in Cost

Engineering and related fields through literature research to obtain effective conclusions.

The requirement can be interpreted from the following perspectives:

Graduates should be able to apply basic principles of mathematics, natural sciences, and engineering sciences to identify and judge complex problems in Cost Engineering and related fields; apply basic principles of mathematics, natural sciences, and engineering sciences to correctly express complex problems in Cost Engineering and related fields; analyze complex problems in Cost Engineering and related fields through literature research and professional collaboration to obtain effective and reasonable conclusions.

(3) Design/Development of Solutions: Ability to develop and design solutions for complex engineering problems, design systems, units (components), or process flows that meet specific needs, demonstrate innovation, and consider feasibility from perspectives such as health and safety, full-life cycle cost and net-zero carbon requirements, law and ethics, and society and culture.

The requirement can be interpreted from the following perspectives:

For complex engineering and economic problems, graduates should be able to use professional knowledge in Cost Engineering and related fields to comprehensively consider social, health, safety, legal, cultural, and other factors for scheme design, structural analysis, plan preparation, etc., and fully reflect innovative awareness. Graduates should be able to use information technology to establish the ability to build building information models, solve professional and related problems in Cost Engineering through computer-aided methods, and carry out resource optimization, scheme comparison, and solution development.

(4) Research: Ability to conduct research on complex engineering problems based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

The requirement can be interpreted from the following perspectives:

According to the theoretical knowledge of Cost Engineering and related disciplines, graduates should be able to carry out research on complex engineering problems in Cost Engineering and related fields through theoretical analysis, literature research, and relevant methods, and adopt reasonable methods to collect basic materials and data; consider multiple influencing factors and management objectives of complex engineering problems in Cost Engineering and related fields, use scientific principles and methods for data analysis and processing, and design specific and feasible research schemes. Graduates should be able to implement specific research schemes and engineering practices, and based on problems arising in the implementation process, compare with scientific objectives, carry out reasonable interpretation, obtain reasonable and effective conclusions, and apply them to engineering practices.

(5) Use of Modern Tools: Ability to develop, select, and use appropriate technologies, resources, modern engineering tools, and information technology tools for complex engineering problems, including prediction and simulation of complex engineering problems, and understand their limitations.

The requirement can be interpreted from the following perspectives:

For complex engineering problems in Cost Engineering and related fields, graduates should be able to use various search tools, professional software, and other modern information technologies for literature retrieval and data query in this major. Graduates should be able to develop or select and use appropriate technologies, modern information tools, and resources to predict and simulate complex engineering problems in Cost Engineering and related fields, and understand their limitations.

(6) Engineering and Sustainable Development: When solving complex engineering problems, analyze and evaluate the impacts of engineering practices on health, safety, the environment, law, and economic and social sustainable development based on engineering-related background knowledge, and understand the responsibilities to be undertaken.

The requirement can be interpreted from the following perspectives:

Based on the background knowledge, standards, and codes of Cost Engineering, graduates should be able to reasonably analyze and evaluate engineering project design, construction, and operation schemes, and judge the impacts of the use of new materials, new processes, new technologies, and new methods; analyze and evaluate the impacts of practical activities and solutions to complex problems in the field of Cost Engineering on society, health, safety, law, and culture, thereby understanding the responsibilities to be undertaken. Graduates should be able to understand the national sustainable development strategies in environmental, social, and other aspects, as well as policies, laws, and regulations related to environmental and social sustainable development, and have awareness of environmental protection and sustainable development. Graduates should be able to understand the impact of practices in Cost Engineering and related fields on sustainable development, adopt scientific evaluation methods in practices of Cost Engineering and related fields to analyze the impact of engineering practices on environmental and social sustainable development, and integrate the concept of sustainable development into engineering practices.

(7) Engineering Ethics and Professional Norms: Ability to have the awareness of serving the country and the people through engineering, possess humanistic and social scientific literacy and social responsibility, be able to understand and apply engineering ethics, and abide by engineering professional ethics, norms, and relevant laws in engineering practices, and fulfill responsibilities.

The requirement can be interpreted from the following perspectives:

Graduates should be able to establish correct worldviews, outlooks on life, and values, have good professional ethics and dedication, and have a strong sense of collective honor and spirit of unity and cooperation. Graduates should be able to understand the professional nature and professional responsibilities of Cost Engineering professionals in the practice of Cost Engineering and related fields, pay attention to professional ethics cultivation, abide by professional ethics norms, and fulfill responsibilities.

(8) Individual and Team: Ability to assume the roles of individual, team member, and leader in a multidisciplinary team.

The requirement can be interpreted from the following perspectives:

Graduates should be able to understand the significance of teamwork, have a sense of teamwork, and be able to assume the roles of individual, team member, and leader in the implementation process of practices in Cost Engineering and related fields. Graduates should be able to play an appropriate role according to role requirements in a multidisciplinary team, organize and coordinate team members to carry out work, coordinate relations with personnel from other disciplines, and jointly solve complex engineering problems in Cost Engineering and related fields.

(9) Communication: Ability to effectively communicate and exchange with industry peers and the public on complex engineering problems, including writing reports and design documents, making presentations, clearly expressing or responding to instructions; communicate and exchange in cross-cultural contexts, and understand and respect language and cultural differences.

The requirement can be interpreted from the following perspectives:

Graduates should be able to effectively communicate and exchange with industry peers and the public on complex engineering problems in Cost Engineering and related fields through written or oral forms, clearly express solutions to construction cost-related problems by writing reports, design documents, making presentations, etc., and answer inquiries. Graduates should have good application ability of professional foreign languages in Cost Engineering, understand the international status of Cost Engineering and related fields, have a certain international vision, and be able to communicate and exchange in cross-cultural contexts.

(10) Project Management: Ability to understand and master the principles of Cost Engineering and economic decision-making methods, as well as related engineering project management knowledge, and be able to apply them in a multidisciplinary environment.

The requirement can be interpreted from the following perspectives:

Graduates should master the principles of construction cost management, possess project management capabilities, and be able to select appropriate management and economic decision-making methods according to the practice of Cost Engineering and related fields. Graduates should be able to apply the principles of Cost Engineering, economic decision-making methods, and engineering project management knowledge to analyze and solve problems such as engineering project economic analysis, investment decision-making, cost control, and scheme comparison.

(11) Lifelong Learning: Ability to have the awareness and ability of autonomous learning and lifelong learning, understand the impact of extensive technological changes on engineering and society, adapt to new technological changes, and have critical thinking skills.

The requirement can be interpreted from the following perspectives:

Graduates should be able to have the ability to actively discover and raise problems, have the awareness and requirement of lifelong learning, master the methods of autonomous learning, and have ways to expand knowledge and capabilities. Graduates should be able to carry out autonomous learning and lifelong learning, master the frontiers and development trends of Cost Engineering and related fields, have strong comprehension abilities in technology, economy, management, law, and information, and have comprehensive analysis and problem-solving abilities.

2. Course-Objective Support Matrix

objective / Curriculum System	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11

objective Curriculum System	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Ideological Morality and Rule by Law							√	√			√
Outline of Chinese Modern and Contemporary History							√	√			√
Basic Principles of Marxism						√	√			√	√
Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics						√		√	√	√	
Introduction for the study of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era						√	√			√	
Situation and Policy						√					√
Advanced Mathematics A	√	√									
Linear Algebra	√	√									
Probability Theory and Mathematical Statistics	√	√									
College Physics	√	√									
Digital Intelligent English					√				√		√
University Digital Intelligence Quality					√						√
Information Retrieval and Utilization				√	√						√
Military Theory							√	√			
Physical Education								√			√
Mental Health Education							√	√	√		

objective Curriculum System	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Education on Outstanding Traditional Chinese Culture							√	√			√
National Security Education							√	√			
Career Planning for College Students							√	√	√		√
Career Guidance for College Students							√	√	√		√
Introduction to Cost Engineering				√				√		√	
Building Materials	√	√				√					
Principles of Management		√		√							
Principles of Economics			√							√	
Principles of Accounting				√		√					
Building Survey	√			√							
Engineering Mechanics and Structures	√	√		√							
Construction Law & Economic Regulations			√			√					
BIM Technology Applications					√						
Management Science	√	√				√					
Construction Technology and Organization in Building Engineering					√	√					
Engineering Project Management		√						√		√	
Estimation of Civil Engineering Quantity and Cost	√									√	
Engineering Economics	√		√							√	
Construction Cost Management	√	√				√				√	

objective / Curriculum System	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Construction Bidding & Contract Management	√	√							√		
Quota Compilation and Application					√						
Innovative Design Thinking			√								√
Fundamentals of Entrepreneurship			√			√					√
Revit Modeling and Application			√		√						
BIM Innovation and Advanced Applications			√			√					
Military Skills Training						√	√	√			
Labor Practice						√					
Civil Engineering CAD Drafting Practicum	√		√								
Architectural Design Innovation Practice	√					√					
Building Surveying & Geospatial Data Processing				√	√						
MEP CAD Drafting Practice	√		√								
Reinforced Concrete Detailing Practice	√		√								
Project Management Practice				√	√						
Revit 3D Modeling Practice			√		√						
BIM-based Quantity Takeoff Practice					√						√
Civil Works Cost Estimation using BIM			√								√
MEP BIM Quantification					√						
MEP Cost Estimation with BIM			√							√	

objective Curriculum System	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Construction Bidding & Contract Management									√	√	
Norm Pricing System Development and Applied Practice						√					√
Integrated Cost Consulting Practice		√		√		√					√
Graduation Internship	√			√		√			√		
Undergraduate Thesis /Design			√	√						√	√

III. Professional Curriculum System and Topological Diagram

1.Curriculum System Diagram

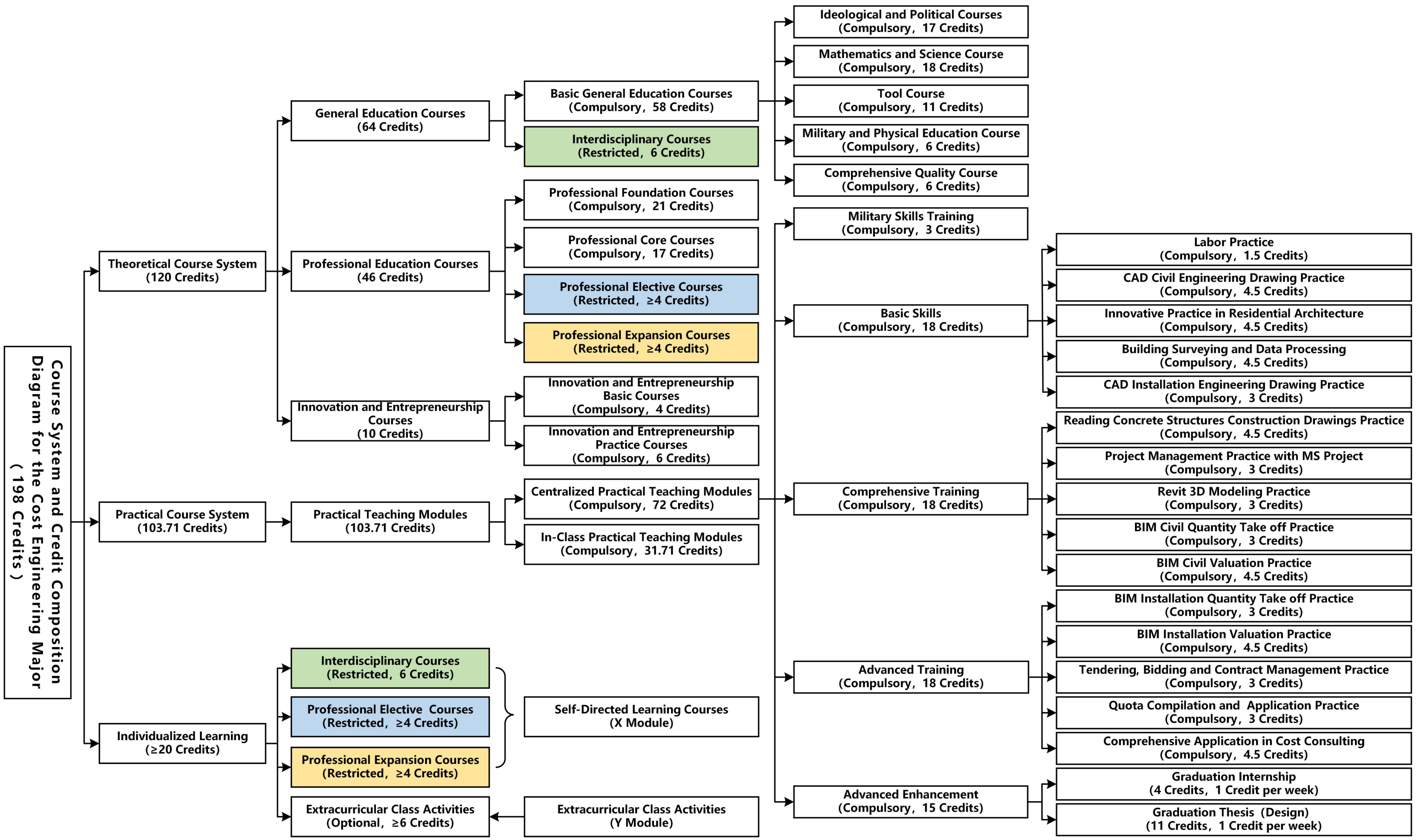

Figure 1 Diagram of Curriculum System and Credit Composition for Construction Cost Major

2.Curriculum Topology Diagram

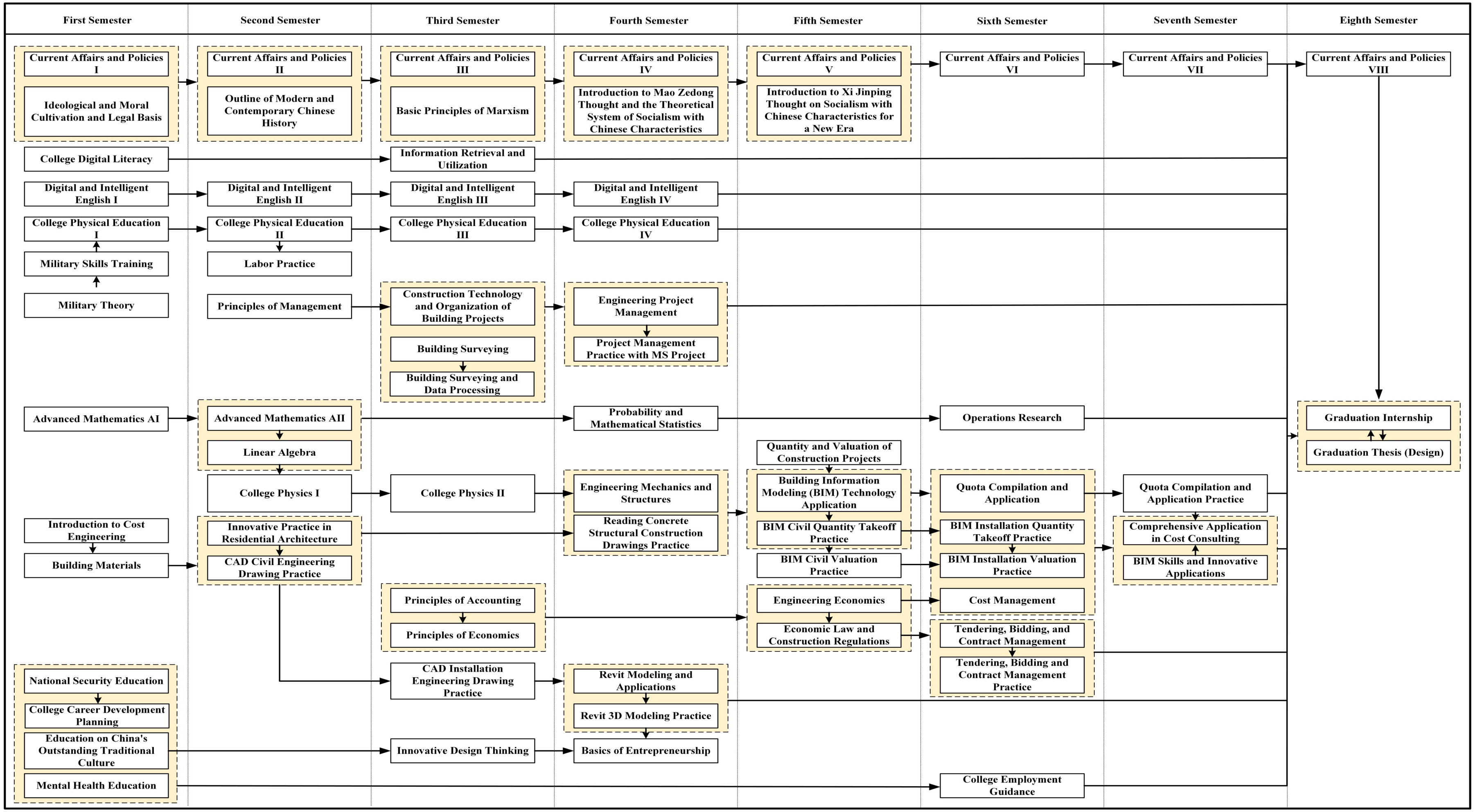

Figure 2: Topology Diagram of Cost Engineering Curriculum

***Professional orientation courses and professional elective courses are not included**

3.Curriculum Balance Rate

Table 2 Semester Teaching Balance Table of Cost Engineering Courses

Semester Distribution	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester6	Semester 7	Semester 8	Proportion
Compulsory Theory	15.96	13.39	16.25	11.96	9.68	8.25	0.25	0.25	**38.38%**
Compulsory Practice	10.29	14.36	11.5	16.79	11.07	12.5	10.5	15	**51.52%**
Recommended Electives	2	1	1	0	4	4	4	4	**10.10%**
Total	**28.25**	**28.75**	**28.75**	**28.75**	**24.75**	**24.75**	**14.75**	**19.25**	**100%**

4.Curriculum Distribution Ratio

Table 3 Credit-Hour Allocation and Proportion Table of Cost Engineering

Category	Credits	Proportion of Total Credits	Class Hours	Proportion of Total Class Hours
Basic General Education	58	29.29%	1624	29.29%
Compulsory Professional Education	38	19.19%	1064	19.19%
Innovation and Entrepreneurship Education	10	5.05%	280	5.05%
Personalized Training	20	10.10%	560	10.10%

Intensive Practical Training Module	72	36.37%	2016	36.37%
Total	**198**	**100%**	**5544**	**100%**

IV. Professional Basic, Core, Elective and Characteristic Courses

1. Professional Basic Courses (10 courses, 21 credits)

Introduction to Cost Engineering (1 credit) , Building Materials (2 credits), Principles of Management (2 credits), Principles of Economics (2 credits), Principles of Accounting (2 credits), Building Survey (2 credits), Engineering Mechanics and Structures (3 credits), Construction Law & Economic Regulations (3 credits), BIM Technology Applications (2 credits), Management Science (2 credits).

2. Professional Core Courses (7 courses, 17 credits)

Construction Technology and Organization in Building Engineering (3 credits), Engineering Project Management (2 credits), Estimation of Civil Engineering Quantity and Cost (3 credits), Engineering Economics (2 credits), Cost Engineering Management (3 credits), Project Bidding and Contract Management (2 credits), Quota Compilation and Application (2 credits).

3. Professional Elective Courses (10 courses, 10 credits)

Engineering Safety and Environmental Protection (1 credit), Construction Project Appraisal (1 credit), Engineering Project Supervisor (1 credit), Prefabricated Construction Technology (1 credit), Green Building and Sustainable Development (1 credit), Engineering Project Audit (1 credit), Introduction to Architectural Design (1 credit), Case Analysis of Cost Engineering (1 credit), Engineering Project Investment & Financing (1 credit), Whole Process Engineering Consulting (1 credit).

4. Professional Characteristic Course (1 course, 2 credits)

Building Information Modeling (BIM) Technology Application (2 credits): This course is designed to meet the development needs of the construction industry. Through software, an actual engineering model is established to guide students in reverse to master professional knowledge such as engineering drawing reading and quantity calculation rules. The on-campus intelligent construction laboratory is utilized to enhance students' integration and understanding of theory and professional practice. "Dual-qualified" professional teachers and industry experts are arranged for teaching. Relying on the school-enterprise cooperation platform, students' practical engineering application ability is improved. Through studying this course, students can proficiently use BIM cost management software, prepare project estimation, budget, settlement and final accounts documents, improve their practical ability in bid quotation, and obtain relevant BIM skill certificates. Meanwhile, in combination with the content of relevant BIM innovation application competitions, emphasis is placed on cultivating students' innovation awareness and creative thinking, improving their teamwork and problem-solving abilities, and enhancing their comprehensive quality.

V. Intensive Practical Teaching Links

1. Military Skills Training (1 course, 3 credits)

2. Basic Skills (5 courses, 16.5 credits)

Labor Practice (1.5 credits), Civil Engineering CAD Drafting Practicum (4.5 credits), Architectural Design Innovation Studio (4.5 credits), Building Surveying & Geospatial Data Processing (4.5 credits), MEP CAD Drafting Practicum (3 credits).

3. Comprehensive Training (5 courses, 18 credits)

Reinforced Concrete Detailing Practicum (4.5 credits), Project Management Practice (3 credits), Revit 3D Modeling Practice (3 credits), BIM-based Quantity Takeoff (3 credits), Civil Works Cost Estimation using BIM (4.5 credits).

4. Extended Training (5 courses, 18 credits)

MEP BIM Quantification (3 credits), MEP Cost Estimation with BIM (4.5 credits), Construction Bidding & Contract Management (3 credits), Quota System Development & Application (3 credits), Integrated Cost Consulting Practice (4.5 credits).

5. Extended Enhancement (2 courses, 15 credits)

Graduation Internship (4 credits), Undergraduate Thesis/Design (11 credits).

VI. Professional Graduation and Degree Awarding Conditions

1. Professional Graduation Conditions

In accordance with the requirements of the Academic Management Rules of Hengxing University, students who have completed 198 credits of courses specified in the training program with qualified grades, and whose achievement degree of each training objective (i.e., graduation requirements) is at least the qualified level (pass), can obtain the Undergraduate DiplomaCost Engineering as conferred by Qingdao Hengxing University of Science and Technology.

The achievement degree of training objectives adopts a grade system, set as five levels: excellent, good, medium, pass, and fail. The corresponding relationship between the grade system and the hundred-mark system is usually: (1) 90-100 points: excellent; (2) 80-89 points: good; (3) 70-79 points: medium; (4) 60-69 points: pass; (5) <60 points: fail.

2. Professional Degree Awarding Conditions

Students who meet the graduation requirements and comply with the requirements of *the Implementation Rules for Awarding Bachelor's Degrees of Hengxing University*, and are approved by the University's Degree Committee, can be awarded the Bachelor of Engineering Degree of Qingdao Hengxing University of Science and Technology.

VII. Professional Teaching Implementation Plan

Table 4　Teaching Implementation Plan for Cost Engineering

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
General Education Courses	**Basic General Education Courses**	**Ideological and Political Courses**	Ideological Morality and Rule by Law	3000000101	compulsory	3	3	48	84	√								Examination	School of Marxism
			Outline of Chinese Modern and Contemporary History	3000000102	compulsory	3	3	48	84		√							Examination	
			Basic Principles of Marxism	3000000103	compulsory	3	3	48	84			√						Examination	
			Introduction to Mao Zedong Thought and the Theoretical System of Socialism	3000000104	compulsory	3	3	48	84				√					Examination	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			with Chinese Characteristics																
			Introduction for the study of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3000000147	compulsory	3	3	48	84					√				Examination	
			Situation and PolicyI	3000000105	compulsory	0.25	0.25	8	7	√								Non-written exam	
			Situation and Policy II	3000000182	compulsory	0.25	0.25	8	7		√							Non-written exam	
			Situation and Policy	3000000106	compulsory	0.25	0.25	8	7			√						Non-written	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			III															exam	
			Situation and Policy IV	3000000183	compulsory	0.25	0.25	8	7				√					Non-written exam	
			Situation and Policy V	3000000107	compulsory	0.25	0.25	8	7					√				Non-written exam	
			Situation and Policy VI	3000000184	compulsory	0.25	0.25	8	7						√			Non-written exam	
			Situation and Policy VII	3000000108	compulsory	0.25	0.25	8	7							√		Non-written exam	
			Situation and Policy VIII	3000000185	compulsory	0.25	0.25	8	7								√	Non-written exam	
			Subtotal 1			**17**	**17**	**304**	**476**									**5 exam-based courses**	
		Mathematical Courses	Advanced Mathematics AI	3000000160	compulsory	5	5	80	140	√								Examination	School of Education
			Advanced Mathematic	3000000161	compulsory	5	5	80	140		√							Examination	

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered: First Academic Year 1	First Academic Year 2	Second Academic Year 3	Second Academic Year 4	Third Academic Year 5	Third Academic Year 6	Fourth Academic Year 7	Fourth Academic Year 8	Evaluation Method	Offering Institution
			s AII																
			Linear Algebra	3000000113	compulsory	2	2	32	56		√							Examination	
			Probability Theory and Mathematical Statistics	3000000114	compulsory	2	2	32	56				√					Examination	
General Education Courses	**Basic General Education Course**	**Mathematical Courses**	University Physics I	3000000139	compulsory	2	2	32	56		√							Examination	School of Education
			University Physics II	3000000140	compulsory	2	2	32	56			√						Examination	School of Education
			Subtotal 2			**18**	**18**	**288**	**504**									**6 exam-based courses**	
		Tools Training Course	Digital Intelligent English I	3000000189	compulsory	2	2	64	56	√								Examination	School of International Education
			Digital Intelligent English II	3000000191	compulsory	2	2	64	56		√							Examination	School of International Education
			Digital Intelligent English III	3000000168	compulsory	2	2	64	56			√						Examination	School of International Education
			Digital	3000000169	compulsory	2	2	64	56				√					Exami	School of International Education

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Intelligent English IV															nation	
			University Digital Intelligence Quality	3000000186	compulsory	2	2	32	56	√								Non-written exam	School of Electronic and Computer Engineering
			Information Retrieval and Utilization	3000000134	compulsory	1	1	16	28			√						Non-written exam	Library
			Subtotal 3			**11**	**11**	**304**	**308**									**4 exam-based courses**	
		Military PE Course	Military Theory	3000000131	compulsory	2	2	32	56	√								Non-written exam	Student Development Office
			Physical EducationI	3000000192	compulsory	1	1	36	28	√								Non-written exam	School of Sports Science and Physical Education
			Physical Education II	3000000193	compulsory	1	1	36	28		√							Non-written exam	
			Physical Education	3000000194	compulsory	1	1	36	28			√						Non-written	

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		Second Academic Year		Third Academic Year		Fourth Academic Year			
										1	2	3	4	5	6	7	8		
			III															exam	
			Physical Education IV	3000000195	compulsory	1	1	36	28				√					Non-written exam	
			Subtotal 4			**6**	**6**	**176**	**168**										
		Comprehensive Quality Education Course	Mental Health Education	3000000129	compulsory	2	2	32	56	√								Non-written exam	School of Education
			Education on Outstanding Traditional Chinese Culture	3000000197	compulsory	1	1	16	28	√								Non-written exam	School of Humanities
			National Security Education	3000000187	compulsory	1	1	16	28	√								Non-written exam	School of Marxism
General Education Courses	**Basic general course**	**Comprehensive Quality Education Course**	Career Planning for College Students	3000000132	compulsory	1	1	16	28	√								Non-written exam	Business School

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Career Guidance for College Students	3000000133	compulsory	1	1	16	28						√			Non-written exam	
			Subtotal 5			**6**	**6**	**96**	**168**										
	Interdisciplinary Liberal Arts Course	**Interdisciplinary Liberal Arts Course**	Art Literacy Course		Restricted Elective	2	2	32	56									Non-written exam	All Academic Units
			Global Competence Curriculum		Restricted Elective	1	1	16	28									Non-written exam	
			Global Competence Activities		Restricted Elective	1	1	16	28									Non-written exam	
			Social Sciences Course		Restricted Elective	1	1	16	28									Non-written exam	
			Natural Sciences Course		Restricted Elective	1	1	16	28									Non-written exam	
			Subtotal 6			**6**	**6**	**96**	**168**										

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
	Total 1= Subtotal 1+ Subtotal 2+ Subtotal 3+ Subtotal 4+ Subtotal 5+ Subtotal 6					**64**	**64**	**1264**	**1792**										
Major Courses	**Fundamental Major Courses**	**Fundamental Major Courses**	Introduction to Cost Engineering	3120105251	compulsory	1	1	16	28	√								Non-written exam	School of Architecture and Civil Engineering
			Building Materials	3120105289	compulsory	2	2	32	56	√								Examination	
			Principles of Management	3120105223	compulsory	2	2	32	56		√							Examination	
			Principles of Economics	3120105255	compulsory	2	2	32	56			√						Examination	
			Principles of Accounting	3120105256	compulsory	2	2	32	56			√						Examination	
			Building Survey	3120105260	compulsory	2	2	32	56			√						Examination	
			Engineering Mechanics	3120105258	compulsory	3	3	48	84				√					Examination	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			and Structures																
			Construction Law & Economic Regulations	3120105257	compulsory	3	3	48	84					√				Examination	
			BIM Technology Applications	3120105262	compulsory	2	2	32	56					√				Non-written exam	
Major Courses	**Fundamental Major Courses**	**Fundamental Major Courses**	Management Science	3120105261	compulsory	2	2	32	56						√			Examination	School of Architecture and Civil Engineering
			Subtotal 1			21	21	336	588									8 exam-based courses	
	Core Major Courses	**Core Major Courses**	BIM Construction Technology and Organization in Building	3120105263	compulsory	3	3	48	84			√						Examination	School of Architecture and Civil Engineering

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Engineering																
			Engineering Project Management	3120105264	compulsory	2	2	32	56				√					Examination	
			Estimation of Civil Engineering Quantity and Cost	3120105265	compulsory	3	3	48	84					√				Examination	
			Engineering Economics	3120105266	compulsory	2	2	32	56					√				Examination	
			Construction Cost Management	3120105267	compulsory	3	3	48	84						√			Examination	
			Construction Bidding & Contract Management	3120105269	compulsory	2	2	32	56						√			Examination	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Quota Compilation and Application	3120105268	compulsory	2	2	32	56						√			Non-written exam	
			Subtotal 2			**17**	**17**	**272**	**476**									**6 exam-based courses**	
	Elective Major Courses	**Concentration Courses**	Engineering Safety and Environmental Protection	3120105290	Restricted Elective	1	1	16	28						√			Non-written exam	School of Architecture and Civil Engineering
			Construction Project Appraisal	3120105291	Restricted Elective	1	1	16	28						√			Non-written exam	
			Engineering Project Supervisor	3120105292	Restricted Elective	1	1	16	28						√			Non-written exam	
			Prefabricated Construction Technology	3120105284	Restricted Elective	1	1	16	28						√			Non-written exam	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Green Building and Sustainable Development	3120105285	Restricted Elective	1	1	16	28						√			Non-written exam	
			Engineering Project Audit	3120105293	Restricted Elective	1	1	16	28							√		Non-written exam	
			Introduction to Architectural Design	3120105294	Restricted Elective	1	1	16	28							√		Non-written exam	
			Case Analysis of Cost Engineering	3120105295	Restricted Elective	1	1	16	28							√		Non-written exam	
			Engineering Project Investment & Financing	3120105286	Restricted Elective	1	1	16	28							√		Non-written exam	

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
Major Courses	**Elective Major Courses**	**Concentration Courses**	Whole Process Engineering Consulting	3120105287	Restricted Elective	1	1	16	28							√		Non-written exam	School of Architecture and Civil Engineering
			Subtotal 3			**≥ 4**	**≥ 4**	**≥ 64**	**≥ 112**										
	Major Enhancement Course	**Major Enhancement Course**	Building Surveying Competition	3120105296	Restricted Elective	2	2	32	56					√				Non-written exam	School of Architecture and Civil Engineering
			CAD Drafting Championship	3120105297	Restricted Elective	2	2	32	56					√				Non-written exam	
			Autodesk Revit Modeling Challenge	3120105298	Restricted Elective	2	2	32	56						√			Non-written exam	
			Glodon GTJ Modeling Competitio	3120105299	Restricted Elective	2	2	32	56						√			Non-written exam	

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		Second Academic Year		Third Academic Year		Fourth Academic Year			
										1	2	3	4	5	6	7	8		
			n																
			Subtotal 4			**≥ 4**	**≥ 4**	**≥ 64**	**≥ 112**										
	Total 2= Subtotal 1+ Subtotal 2+ Subtotal 3+ Subtotal 4					**≥ 46**	**≥ 46**	**≥ 736**	**≥ 1288**										
Innovation and Entrepreneurship Education Courses	**Innovation and Entrepreneurship Education Courses**	**Fundamentals of Innovation and Entrepreneurship**	Innovative Design Thinking	3000000305	compulsory	2	2	32	56			√						Non-written exam	School of Innovation & Entrepreneurship
			Fundamentals of Entrepreneurship	3000000306	compulsory	2	2	32	56				√					Non-written exam	
			Subtotal 1			**4**	**4**	**64**	**112**										
		Hands-on Innovation & Entrepreneurship Program	Revit Modeling and Application	3120105301	compulsory	2	3	32	84				√					Non-written exam	School of Architecture and Civil Engineering
			BIM Innovation and Advanced	3120105303	compulsory	2	3	32	84							√		Non-written exam	

Course Type	Course Level	Course Module	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Applications																
			Subtotal 2			**4**	**6**	**64**	**168**										
	Total 3= Subtotal 1+ Subtotal 2					**8**	**10**	**128**	**280**										
Intensive Practical Training Module	**Intensive Practical Training Module**	Military Skills Training		3000000196	compulsory	2	3	32	84	√								Non-written exam	Student Development Office
		Basic Skills	Labor Practice	3120105530	compulsory	1	1.5	16	42		√							Non-written exam	School of Architecture and Civil Engineering
			Civil Engineering CAD Drafting Practicum	3120105531	compulsory	3	4.5	48	126		√							Non-written exam	
			Architectural Design Innovation Studio	3120105532	compulsory	3	4.5	48	126		√							Non-written exam	
Intensive Practical Training Module	**Intensive Practical Training Module**	**Basic Skills**	Building Surveying &	3120105533	compulsory	3	4.5	48	126			√						Non-written exam	School of Architecture and Civil

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Geospatial Data Processing																Engineering
			MEP CAD Drafting Practicum	3120105534	compulsory	2	3	32	84			√						Non-written exam	
		Integrated Training	Reinforced Concrete Detailing Practicum	3120105535	compulsory	3	4.5	48	126				√					Non-written exam	
			Project Management Practice	3120105536	compulsory	2	3	32	84				√					Non-written exam	
			Revit 3D Modeling Practice	3120105537	compulsory	2	3	32	84				√					Non-written exam	
			BIM-based Quantity Takeoff	3120105538	compulsory	2	3	32	84					√				Non-written exam	
			Civil Works Cost Estimation using BIM	3120105539	compulsory	3	4.5	48	126					√				Non-written exam	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
		Outward Bound Training	MEP BIM Quantification	3120105540	compulsory	2	3	32	84						√			Non-written exam	
			MEP Cost Estimation with BIM	3120105541	compulsory	3	4.5	48	126						√			Non-written exam	
			Construction Bidding & Contract Management	3120105542	compulsory	2	3	32	84						√			Non-written exam	
			Quota System Development & Application	3120105543	compulsory	2	3	32	84							√		Non-written exam	
			Integrated Cost Consulting Practice	3120105544	compulsory	3	4.5	48	126							√		Non-written exam	
		Competency Expansion Program	Graduation Internship	3120105527	compulsory	2	4	32	112								√	Non-written exam	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Undergraduate Thesis/Design	3120105602	compulsory	4	11	64	308								√	Non-written exam	
	Total 4					**44**	**72**	**704**	**2016**										
Co-curricular Activities	**Co-curricular Activities**	**Co-curricular Activities**	Labor Education Activities	3000000907	Restricted Elective	1	1.5	16	42									Non-written exam	Communist Youth League Committee
			Selected Readings from 100 Chinese and International Classics	3000000901	Restricted Elective	1	1.5	3	8									Non-written exam	
			Freshman Orientation Program	3000000902	Restricted Elective			3	8									Non-written exam	
			Student Organizations	3000000904	Restricted Elective			3	8									Non-written exam	
Co-curricular Activities	**Co-curricular Activities**	**Co-curricular Activities**	Sports	3000000905	Restricted			4	10									Non-w	Communist

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Activities		Elective													ritten exam	Youth League Committee
			Aesthetic Education Initiatives	3000000906	Restricted Elective			3	8									Non-written exam	
			Ideological-Political Cultivation	3000000908	Free Elective													Non-written exam	
			Student Club Cultural-Sports Events	3000000909	Free Elective													Non-written exam	
			Volunteer & Philanthropic Services	3000000910	Free Elective	2	3	32	84									Non-written exam	
			Innovation, Entrepreneurship & Creativity (IEC)	3000000911	Free Elective													Non-written exam	
			Activities of	3000000912	Free Elective													Non-written	

Course Type	**Course Level**	**Course Module**	Course Name	Course Code	Course Nature	Chinese Credits	ECTS	Chinese Class Hours	ECTS Hours	Semester Offered								Evaluation Method	Offering Institution
										First Academic Year		**Second Academic Year**		**Third Academic Year**		**Fourth Academic Year**			
										1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
			Hands-on Practicum, Professional Internship & Technical Simulation Training															exam	
			Competency & Specialty Development	3000000913	Free Elective													Non-written exam	
	Total 5					**≥ 4**	**≥ 6**	**≥ 64**	**≥ 168**										
Grand Total = Total 1+ Total 2+ Total 3+ Total 4+ Total 5						**≥ 166**	**≥ 198**	**≥ 2896**	**≥ 5544**										

VIII Courses Offered to Other Majors

Introduction to Cost Engineering (1 Credit), Technical Economics (1 Credit).

<table>
<tr><td rowspan="2">Revision</td><td>Director of Teaching and Research Section
Signature</td><td colspan="3">Lan Tingting</td></tr>
<tr><td>Program Director
Signature</td><td>Chen Liwen</td><td>Discipline Leader
Signature</td><td>Chen Liwen</td></tr>
<tr><td rowspan="2">Review</td><td>Industry Dean
Signature</td><td>Wang Zheng</td><td>Dean of Academic Affairs
Signature</td><td>Wang Ping</td></tr>
<tr><td>Executive Dean
Signature and Date</td><td colspan="3">Jiang Zhaofei</td></tr>
</table>