湖南城市学院

Hunan City University

PROGRAMME SELF-ASSESSMENT REPORT

Chemical Engineering and Technology

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A About the Accreditation Procedure

General data

Name of the Higher Education Institution	www.hncu.edu.cn
Faculty/Department offering the Degree Programme	College of Materials and Chemical Engineering, Chemical Engineering and Technology

Seals applied for

Name of the degree programme (in original language)	**(Official) English translation of the name**	**Labels applied for**	**Previous accreditation (issuing agency, validity)**	**Involved Technical Committees (TC)**
化学工程与工艺	Chemical Engineering and Technology	ASIIN Seal for a bachelor's degree programme		TC 09

B Characteristics of the Degree Programme

Name (English translation)	Final degree (original/English translation)	Areas of Specialisation (if compulsory)	Corresponding level of the EQF	Mode of Study	Double/Joint Degree	Duration	Credit points/unit	First time of offer
Chemical Engineering and Technology	工学学士/B. Eng.	Chemical Engineering and Technology	6	Full time	/	8 semesters	219 ECTS	September 1, 2003

Name	Intake rhythm	Intake Capacity per cohort	Average starting cohort size	Average number of graduates per cohort	Average time required to complete studies
Chemical Engineering and Technology	Annually	Max. 110 students	87 students	84 students	4 years

C Self-assessment for the ASIIN-Seal

Dear ASIIN Team,

Thank you for giving us the opportunity to participate in the International ASIIN Program Accreditation. We are very pleased to submit the Self-Assessment Report for an International ASIIN Program Accreditation for the Majors of Chemical Engineering and Technology. A brief overview of our University, College, and Major is introduced as follows:

Hunan City University (HNCU) is a full-time undergraduate institution supported by the Hunan Provincial Government. Our mission is to cultivate high-quality applied talents, guided by our "1234" system for applied talent education. This framework emphasizes the development of student capabilities while integrating ideological and political education, as well as innovation and entrepreneurship education, throughout the training process. For further details, please visit our website: https://english.hncu.edu.cn/.

The College of Materials and Chemical Engineering currently has 4 undergraduate majors. The college focuses on the academic frontier of the industry, benchmarking the requirements of new technologies, new processes and new business models for the quality of new engineering talents. In 2019, it will fully launch the engineering education evaluation (certification) of Chemical Engineering and Technology majors, establish a new education and teaching talent training model based on the OBE concept, and focus on the cultivation of students' innovation consciousness and innovation ability.

The Chemical Engineering and Technology is divided into two directions: fine chemicals and biochemicals. This major is rooted in the regional economic and social development needs, focuses on the main battlefield of new chemical industry, and aims to cultivate high-quality applied talents who meet the needs of national development strategies. The program systematically equips students with chemical

engineering expertise, engineering practical abilities, lifelong learning capabilities, innovation awareness, and the competency to excel in chemical engineering positions. Graduates will possess strong professional quality and social responsibility, enabling them to contribute effectively to the chemical industry. For details, please refer to the website:
https://xchy.hncu.edu.cn/ASIINrz/Chemical_Engineering_and_Technology/pymb_Objectives.htm.

1 The Degree Programme: Concept, Content & Implementation

1.1 Objectives and learning outcomes of a degree programme

1.1.1 Training objectives

This program aims to utilize the resources of Hunan while supporting the economic development of the Yangtze River Delta and Pearl River Delta regions, with a particular emphasis on the chemical industry, focusing on fine chemicals and biochemicals. It highlights the local characteristic resources and advantageous industries of Yiyang, aiming to cultivate well-rounded individuals who develop morally, intellectually, physically, aesthetically, and through labor. Graduates will have a solid foundation in natural sciences and engineering, coupled with specialized knowledge and skills. They will also possess a strong sense of social responsibility, professional ethics, good physical and mental health, and a spirit of teamwork. Furthermore, they will have an international perspective, an innovative spirit, and practical abilities, enabling them to engage in high-quality applied engineering and technical work in fields such as fine chemicals, energy, food, and environmental protection, including engineering design, technology development, process analysis and synthesis, production technology management, and analytical testing. Upon completing the undergraduate program, graduates will be equipped with the following capabilities:

Objective 1: Engineering Problem-Solving Competence. Apply integrated knowledge of mathematics, natural sciences, engineering economics, and management principles to systematically analyze complex chemical engineering challenges, developing industry-compliant technical solutions.

Objective 2: Engineering Ethics & Social Responsibility. Develop humanistic literacy and engineering ethics frameworks. Implement chemical engineering projects with rigorous consideration of societal safety, environmental sustainability, and socialist core values.

Objective 3: Process Innovation & Sustainable Practice. Cultivate advanced capabilities in chemical process optimization and system engineering. Execute full-cycle engineering practices (R&D-design-production-testing) with comprehensive sustainability assessments, positioning graduates as technical leaders in process engineering and quality management.

Objective 4: Collaborative Leadership. Develop cross-functional communication proficiency for effective collaboration with industry professionals, interdisciplinary experts, and community stakeholders.

Objective 5: Global Competence & Lifelong Development. Foster global engineering perspectives through continuous knowledge system upgrading, maintaining professional currency in evolving chemical engineering paradigms through self-directed learning.

1.1.2 Achievements of the training

This major's graduates support the leadership of the Communist Party of China, love the socialist motherland, and master Marxism, Mao Zedong Thought, the theoretical system of socialism with Chinese characteristics, and Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era. They possess a correct worldview, outlook on life, and values, adhere to laws and regulations, work collaboratively, take pride in their work, and are willing to contribute. Furthermore, they exhibit the following knowledge, abilities, and qualities:

Graduation requirement 1: Knowledge of engineering : Capable of applying

mathematics, natural sciences, engineering fundamentals, and professional knowledge to analyze and solve complex engineering problems within the field of chemical engineering.

Graduation requirements 2: Ability of problem analysis: The ability to identify, articulate, and evaluate complex engineering issues within chemical production processes is achieved through a grasp of engineering fundamentals and relevant chemical engineering theories. This involves employing methods such as research and literature review to propose solutions and draw valid conclusions.

Graduation Requirement 3: Ability of design/development solutions: Utilizing the principles of chemical engineering and technology, one must design and develop chemical products, systems, equipment, and processes that satisfy the needs of the national economy. This should be done while considering social, health, safety, legal, cultural, and environmental factors, and demonstrating innovative awareness throughout the design and development process.

Graduation Requirement 4: Ability of research: The ability to conduct research on complex engineering problems in chemical engineering and technology is based on scientific principles and methods. This includes designing experimental research plans, constructing apparatus, acquiring data, analyzing and interpreting results to draw valid conclusions, and conducting thorough analysis and interpretation of those conclusions.

Graduation Requirement 5: Ability of using modern tools: The capability to develop, select, and utilize appropriate instruments, information resources, process simulation software, and other modern tools in chemical research, design, and calculations is essential for solving complex engineering problems. Understanding the limitations of these modern tools is also necessary. They can also employ modern technological means to predict, simulate, and optimize chemical processes, addressing complex engineering issues in chemical production.

Graduation Requirement 6: Ability of engineering and social practice: The ability to analyze and evaluate the impact of engineering practices and solutions to

complex chemical engineering problems on society, health, safety, legal matters, and culture is based on one's background knowledge of chemical engineering. It also involves understanding one's responsibilities in this regard.

Graduation Requirement 7: Ability of environmental and sustainable development: The capacity to understand and evaluate the impact of engineering practices in chemical processes on environmental protection and social sustainable development concerning complex chemical engineering issues.

Graduation Requirement 8: Professional norms: Possessing a correct worldview, outlook on life, and core socialist values, one should be able to understand and comply with engineering ethics and norms in engineering practice. This includes fulfilling responsibilities and promoting virtue.

Graduation Requirement 9: Ability of individual and team cooperation: Possessing organizational management skills, expressive ability, interpersonal skills, team awareness, and teamwork abilities that meet the demands of positions in the chemical industry, one can take on individual, team member, and leadership roles within multidisciplinary teams such as chemical engineering and environmental engineering.

Graduation Requirement 10: Skill of communication: The ability to effectively communicate and interact with peers, industry professionals, and the public on complex issues in chemical engineering is essential. This includes writing reports and design documents, making presentations, clearly expressing or responding to instructions, and possessing a certain degree of international perspective to communicate and interact in a cross-cultural context.

Graduation Requirement 11: Ability of project management: The ability to apply engineering management principles and economic decision-making methods to the design and management of chemical processes and practices.

Graduation Requirement 12: Ability of lifelong learning: Possessing a self-directed learning and lifelong learning awareness, one should constantly engage in independent study and adapt to professional and societal developments in the

chemical industry.

1.1.3 Evaluation and demand

（1) Evaluation

The Chemical Engineering and Technology program, an undergraduate offering at Hunan City University, has consistently achieved high-quality results in assessments conducted by the Ministry of Education. It successfully completed the undergraduate teaching quality assessment in 2012, the teaching audit assessment in 2018, and the educational review assessment in 2024. The evaluations underscore that the curriculum is well-structured, closely aligned with market demand, and that the learning outcomes meet the expected goals. Students have expressed high satisfaction with the educational and teaching quality, with a 100% excellent rating in student evaluations over the past three years. Graduates have shown strong adaptability post-graduation. Among them, the awards and project status of the subject competition are detailed in **20_Student Surveys and Results_A-1.**

（2）Demand

Graduates of this major possess solid foundational knowledge, strong practical skills, good adaptability, and innovative capabilities, making them widely accepted in the job market and favored by employers. The primary employment destinations for graduates include companies in the energy, testing, environmental, and materials chemistry sectors, with a high rate of relevance to their field of study. In recent years, the employment rate has consistently exceeded 90%, reaching as high as 100%, and remains stable. Major employers include the China National Nuclear Corporation, Sinopec, and Dongyangguang Group. Additionally, some students choose to continue their education, with an average graduate school admission rate of about 28% over the past three years, and the rate for the 2024 graduating class reaching 35%, ranking among the top in the university. Most students were admitted to well-known domestic universities such as the South China University of Technology, China University of Petroleum, Hunan University, and Beijing University of Chemical Technology.

1.1.4 Target matrix

Table 1-1 is a matrix of objectives-module compared with the ASIIN the ASIIN Subject-Specific Criteria (SSC). And the mapping relationship between degree courses and training outcomes is shown in **07_Objective-Module Matrix_A-2**, which is reviewed According to more relevant management measures (**02_Quality Management Handbook_A-3**) by the Hunan City University Teaching Guidance Committee. Details of the knowledge, skills and competencies achieved in each course can be found in **08_Study Plan or Curricular Overview_A-4** of the syllabus.

Table 1-1 A matrix of objective-module compared with the ASIIN SSC

Training objectives	Learning outcomes of the study programme	Corresponding module
Apply integrated knowledge of mathematics, natural sciences, engineering economics, and management principles to systematically analyze complex chemical engineering challenges, developing industry-compliant technical solutions.	**Knowledge:** Mastery of fundamental knowledge in mathematics, natural sciences, information technology, and computer-related fields. **Skills:** The ability to apply mathematical knowledge to understand and appropriately express engineering practical problems, and to establish basic models to solve various practical problems in technology and engineering applications. **Competences:** The ability to observe, analyze, and solve technical problems using the perspectives and thinking methods of mathematics and information technology. Based on the characteristics of mathematics and information technology, one can conduct continuous analysis, synthesis, calculation, judgment, and reasoning on engineering phenomena, thereby solving engineering problems.	1) General education 2) Discipline fundamentals 3) Core specializations 4) Intensive practical training
Develop humanistic literacy and engineering ethics frameworks. Implement chemical engineering projects with rigorous consideration of societal safety, environmental	**Knowledge:** Master the knowledge of modern Chinese history, the basic principles of Marxism, patriotism, humanistic spirit, physical education, and military training. **Skills:** Understand social phenomena, pay attention to and adapt to social development, possess the ability to communicate and collaborate with others, exhibit team spirit, and promote physical and mental	1) General education 2) Core specializations 3) Autonomous development

sustainability, and socialist core values.	health and self-improvement. **Competences:** Develop a sound personality and good psychological qualities, hold a correct worldview, values, moral views, and legal perspectives, and possess cultural literacy and a sense of social responsibility.	
Cultivate advanced capabilities in chemical process optimization and system engineering. Execute full-cycle engineering practices (R&D-design-production -testing) with comprehensive sustainability assessments, positioning graduates as technical leaders in process engineering and quality management.	**Knowledge:** Master professional knowledge in chemical engineering and technology, particularly in the design of processes related to chemical reactions and separation processes. **Skills:** Possess specialized knowledge to analyze and solve practical problems in chemical engineering and technology, design chemical reaction processes that meet specific needs, and provide solutions for complex chemical reaction engineering problems, including prediction and simulation of complex chemical engineering and technology issues. **Competences:** Master comprehensive knowledge in system design, diagnosis, energy saving and optimization, operation, and management in chemical engineering and technology. Able to analyze and evaluate practical problems using engineering background knowledge, understand its limitations, demonstrate innovative awareness in the design phase, and provide valuable solutions.	1) General education 2) Core specializations 3) Intensive practical training
Develop cross-functional communication proficiency for effective collaboration with industry professionals, interdisciplinary experts, and community stakeholders.	**Knowledge:** Master a foreign language and pass the National College English Test Band 4, acquiring core knowledge in English. **Skills:** Read professional literature in English and communicate and discuss professional issues with others in the language. **Competences:** Possess comprehensive expertise in the English specialty, enabling work in relevant national fields and the ability to conduct cross-cultural communication.	General education
Foster global engineering perspectives through continuous knowledge system upgrading, maintaining professional currency in evolving chemical engineering paradigms	**Knowledge:** Master specialized knowledge in cutting-edge fields related to design. **Skills:** Broaden professional knowledge, stay abreast of trends in professional and related fields, and develop the capacity for knowledge accumulation and in-depth study. **Competences:** Cultivate comprehensive qualities in interdisciplinary fields related to this course, and be	1) General education 2) Intensive practical training

through self-directed learning.	capable of applying learned professional knowledge in a broad range of applications.	

1.2 Name of the degree programme

The curriculum system for this major is meticulously structured in strict compliance with the Ministry of Education's "National Teaching Quality Standards for Undergraduate Programs," while simultaneously addressing contemporary industry demands through collaborative design processes. The framework establishes an integrated educational pathway comprising five interconnected components: General Education, Discipline Fundamentals, Core Specializations, Autonomous Development, and Intensive Practical Training. This comprehensive architecture systematically supports the achievement of program-specific talent development objectives.

Developed through extensive consultation with external academic authorities and industry practitioners, the curriculum demonstrates explicit alignment with graduate competency requirements. It embodies an educational philosophy that harmonizes moral cultivation with intellectual rigor, physical wellness, aesthetic appreciation, and vocational skills - reflecting both the program's professional orientation and contemporary educational priorities. The system particularly emphasizes fostering students' innovative capacities and practical competencies through its progressive learning design.

(1) General Education courses encompass ideological and political education, English, computer science, vocational employment and entrepreneurship, physical education, and mental health. Additionally, students must complete elective courses in innovation and entrepreneurship, humanities and social sciences, and arts and physical education to foster independent development.

(2) Discipline Fundamentals courses are divided into two categories: public foundational courses, which include mathematics and physics; and professional foundational courses, which encompass inorganic chemistry and its experiments,

organic chemistry and its experiments, physical chemistry and its experiments, analytical chemistry and its experiments, and biochemistry and its experiments.

(3) Core Specializations courses include chemical engineering drawing, Chemical Engineering Principles A, Chemical Engineering Principles Experiment A, Chemical Engineering Principles Simulation Experiment, Chemical Reaction Engineering, Chemical Engineering Laboratory, Chemical Thermodynamics, Chemical Separation Engineering, Chemical Process Engineering, Chemical Safety and Environmental Protection, Professional English and Literature Retrieval B, Fundamentals of Chemical Machinery and Equipment, Chemical Process Analysis and Synthesis, Chemical Design A, and Chemical Instruments and Automation.

(4) Independent Development courses consist of elective courses in two professional directions (Fine Chemicals and Biochemical Engineering), primarily offering Instrumental Analysis and its experiments, Chemical Technology Economics, Chemical Process Simulation Training (Aspen Plus), Industrial Catalysis, Bioreaction Engineering, and Biochemical Engineering Laboratory.

(5) Concentrated Practice courses include Metalworking Training A, Electrical and Electronic Training A, Chemical Engineering Familiarization Internship, Chemical Production Internship, Chemical Engineering Principles Course Design, Chemical Design B, and Comprehensive Training for Chemical Engineering Graduation.

1.3 Curriculum

1.3.1 Content

Expected learning outcomes, basic requirements, and corresponding courses for the five major modules based on the training objectives:

General Education Courses

Intended Learning Outcomes: Students should master the fundamental knowledge of humanities and social sciences, cultivate cultural literacy, engage in physical exercise to maintain physical health, participate in practical and group

activities for self-improvement, enhance effective communication skills, and develop social and teamwork abilities. They should also adapt to new environments and societies, and take on professional, social, and environmental responsibilities.

Basic Requirements: Students must understand the basic principles of humanities and social sciences; engage in physical exercise to maintain health; participate in various social practice activities to promote self-realization and team spirit; adapt to social development, and assume environmental and social responsibilities.

Related Courses: Moral and Legal Education, Outline of Modern Chinese History, Fundamentals of Marxism, Introduction to Mao Zedong Thought and the Theories of Socialism with Chinese Characteristics, Current Affairs and Policies, College English (1-2), Expanded Series of College English Courses (1-2), Practical Writing, Mental Health Education for College Students, Career Development and Employment Guidance for College Students (1-2), Fundamentals of Innovation and Entrepreneurship, Military Theory for College Students, Basic Computer Skills for College Students, Computer Programming Languages, College Sports and Health (1-4), and other compulsory general education courses.

Fundamental courses

Expected learning outcomes: Students should master the fundamental knowledge related to the Chemical Engineering and Technology discipline and be capable of effectively applying tools from mathematics, physics, chemistry, and chemical engineering technologies to solve practical problems in the chemical and chemical engineering fields, laying a solid foundation for future studies.

Basic requirements: Students must use tools such as mathematical, physical, chemical, and chemical engineering techniques to solve fundamental scientific and technical problems related to the chemical engineering and technology discipline.

Related courses: Advanced Mathematics A (1-2), Linear Algebra, Probability Theory and Mathematical Statistics, University Physics B (1), University Physics

Experiment, Inorganic Chemistry A (1-2), Inorganic Chemistry Experiment A, Organic Chemistry A (1-2), Organic Chemistry Experiment A (1-2), Analytical Chemistry, Analytical Chemistry Experiment, Physical Chemistry A (1-2), Physical Chemistry Experiment B (1-2), Biochemistry and Biochemistry Experiment.

Core professional courses

Expected learning outcomes: Students should master the professional knowledge and skills in chemical engineering and technology, as well as related fields, and be adept at analyzing and solving complex chemical engineering and chemical process problems.

Basic requirements: Students must master the professional knowledge and skills in chemical engineering and technology, including its subfields. They should understand the interdisciplinary and emerging areas of professional knowledge, possess the skills necessary for professional work in chemical engineering and technology and related fields, and have the ability to modify and optimize existing chemical engineering systems.

Related courses: Introduction to Chemical Engineering, Chemical Engineering Drawing, Chemical Engineering Principles A (1-2), Chemical Engineering Principles Laboratory A, Chemical Engineering Principles Simulation Experiment, Chemical Reaction Engineering, Chemical Engineering Professional Laboratory, Chemical Engineering Thermodynamics, Chemical Separation Engineering, Chemical Engineering Process, Chemical Engineering Safety and Environmental Protection, Professional English and Literature Retrieval B, Fundamentals of Chemical Engineering Equipment, Chemical Process Analysis and Synthesis, Chemical Engineering Design A, Chemical Instruments and Automation.

Independent development courses

Expected learning outcomes: Students, based on their individual learning levels and professional interests, can select from various directions such as fine chemicals or biochemical engineering. They will expand their interdisciplinary knowledge and skills, thereby facilitating future career choices. Basic requirements: Students must

master professional knowledge and skills in fine chemicals or biochemical engineering, understand the professional knowledge involved in interdisciplinary and new fields, and possess the necessary professional skills for fine chemicals or biochemical engineering. Furthermore, they should develop the ability to transform and optimize existing systems.

Related courses: Fine Chemical Product Formula Design, Chemical Experiment Design and Data Processing, Human Resource Management in Chemical Enterprises, Instrumental Analysis, Instrumental Analysis Laboratory, Chemical Technology Economics, Electrical and Electronic Technology, Chemical Process Simulation Training (Aspen Plus), Chemical Technology Economics, Frontier Lectures on Chemical Engineering, Chemical Experiment Design and Data Processing, Molecular Biology, Instrumental Analysis, Instrumental Analysis Laboratory, Electrical and Electronic Technology (at least 9 credits in each direction), Fine Organic Synthesis Unit Reactions, Fine Chemical Engineering Process, Fine Chemical Engineering Professional Laboratory, Industrial Catalysis, Circular Economy and Resource Recycling, Bioreactor Engineering, Fermentation Engineering, Biochemical Engineering Professional Laboratory, Food Biotechnology, Biochemical Separation Technology, Biochemical Engineering Process (at least 5 credits), Innovation and Entrepreneurship Courses, Humanities and Social Sciences Courses, Art and Physical Education Courses (at least 7 credits).

Concentration practical courses

Expected learning outcomes: The aim is to cultivate design practice, engineering application, and innovation capabilities. Through practical training, students will learn to apply professional theoretical knowledge in chemistry, chemical engineering, and chemical design to analyze and solve design and practical problems. Basic requirements: Students should use theoretical knowledge and practical skills to address real-world problems, reinforce foundational theoretical knowledge, deepen their understanding of industrial design applications, and enhance their innovation capabilities.

Related courses include: Orientation and Military Training, Public Welfare Labor, Social Practice and Volunteer Services, Metalworking Practice, Electrical and Electronics Practice, Chemical Engineering Orientation Internship, Chemical Production Internship, Chemical Principles Course Design, Chemical Engineering Design, Comprehensive Chemical Engineering Graduation Training.

The class hours and credits for each module are detailed in the undergraduate talent training program for Chemical Engineering and Technology (Attachment B-1). In accordance with the national standards for teaching quality in Chemical Engineering and Pharmaceutical programs (Chemical Engineering programs), the objectives for training, professional knowledge system, and core course system suggestions, as well as the standards of engineering education accreditation for Chemical Engineering, Pharmaceutical, Biochemical Engineering, and related programs, the credit proportion for each module course within the overall training plan is set, as shown in Figure 3-1.

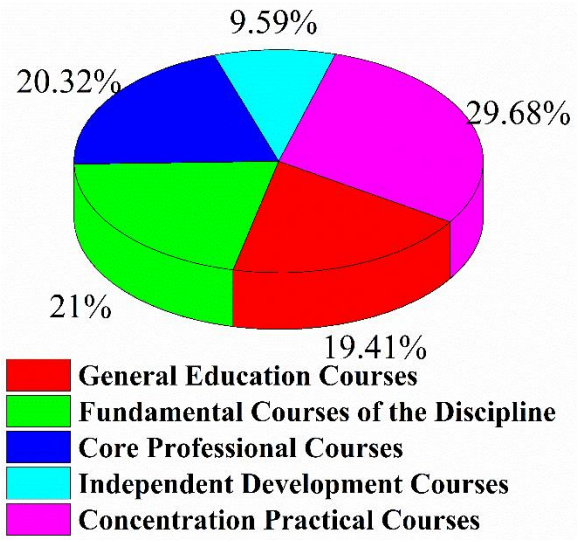

Figure 3-1 Proportion of credits in different competence fields

1.3.2 Structure of the programme

The undergraduate training program for this major follows a four-year system. Overall, the course system encompasses five major competency areas, with the learning content of these areas interwoven and correlated in chronological order. In terms of credits and the distribution of class hours across various competency

areas, general education courses are scheduled from the 1st to the 6th semester. These courses include philosophy (humanities and political education), modern Chinese history, English, applied writing, mental health education, innovation and entrepreneurship, career development and employment guidance, military theory, computer science, physical education, and more. These courses are designed to familiarize students with relevant knowledge in humanities, history, politics, military, law, English, computer science, mental health, and career planning, thereby enhancing students' intercultural communication skills and humanistic literacy.

The foundational courses are scheduled in the 1st to 4th semesters, including advanced mathematics, linear algebra, probability theory and mathematical statistics, university physics, inorganic chemistry, organic chemistry, analytical chemistry, physical chemistry, biochemistry, and related laboratory courses. These courses lay the groundwork for subsequent professional courses. Core professional courses are scheduled in the 5th to 7th semesters. These courses are crucial within the entire curriculum system and aim to deepen and expand students' professional knowledge and applications in the field of chemical engineering design. Self-development courses are arranged in the 6th to 7th semesters to broaden interdisciplinary knowledge and skills while catering to students' personal professional interests. The practical training courses are integrated throughout the program, arranged in the 1st to 8th semesters, allowing students to apply the theoretical knowledge learned to chemical engineering practice in a timely manner, helping them accumulate substantial real-world engineering experience and enhancing their employability. Among the practical courses, the comprehensive chemical engineering training is scheduled in the 8th semester, with most topics sourced from the research projects of faculty members or actual R&D projects from enterprises. Based on the course structure, students will ultimately earn 219 ECTS credits after completing the 8 semesters of study.

1.4 Admission requirements

1.4.1 Admission conditions

According to the Education Law of the Peoples Republic of China, the Higher Education Law of the Peoples Republic of China, and other relevant laws and regulations as well as the provisions of the Ministry of Education, all individuals entering Hunan City University to study for a bachelors' degree or pursue a bachelor degree must participate in the National Examination for College Admissions. Those who meet the following conditions may apply: (1) Complying with the provisions of the Constitution and laws of the Peoples Republic of China; (2) Holding high school graduation or equivalent academic qualifications; (3) Being in good health: ①No major infectious diseases, maintaining public health and safety; ②Physical requirements of special majors, such as the art painting major requires the ability to distinguish colors normally.

1.4.2 Admission process

Chinese universities implement unified national enrollment. According to the scores, candidates are divided into the first batch, second batch, and third batch, and are admitted in order of their scores (from high to low). Overall, Hunan City University's Chemical Engineering and Technology program is admitted in the first batch.

During the admission stage, the enrollment department of Hunan City University evaluates candidates comprehensively based on their moral, intellectual, and physical qualities according to the predetermined enrollment plan, primarily selecting the best candidates based on their scores. The typical admission process includes: file submission, document review, preliminary admission, admission examination, and issuance of admission notices.

When the freshmen enrolled at Hunan City University, they need to provide their admission notices and identification documents and then register according to the recommendations in the registration guidelines at the corresponding department. The

typical enrollment process includes: confirming enrollment, paying tuition, registering for academic status, collecting learning tools and supplies etc.

1.4.3 Admission transparency

The admission and enrollment process for freshmen at Hunan City University strictly follows relevant procedural documents, ensuring a high degree of transparency. According to the "Education Law of the Peoples Republic of China," the recruitment and enrollment work for ordinary higher education institutions in China operates under a mechanism where "universities are responsible, and the admissions office supervises." Here, the "admissions office" refers to the provincial admissions office where the candidate is located, not the university admissions office. This means that for candidates who have passed the political and ideological assessment, abode by laws and regulations, completed the physical examination, scored above control line of the same batch's admission, and met the schools file adjustment requirements. Whether they are admitted and which major they will be enrolled in are determined by the higher education institution itself.

The school has promulgated and implemented the "Hunan City University 2024 General Higher Education Admission Brochure" (see **10_Recognition of Aquired Academic Qualifications_A-5**), the "Hunan City University Online Admission Management Regulations" (see **10_Recognition of Aquired Academic Qualifications_A-6**), and the "Hunan City University Online File Review Guidelines" (see **10_Recognition of Aquired Academic Qualifications_A-7**) to standardize the enrollment process and improve promotional channels.

The institutions of higher education shall be responsible for the interpretation of candidates without being admitted and the problems unsolved. The provincial enrollment offices where the candidates are located shall organize and implement the submission of electronic files of qualified students to the institutions of higher education, supervise the institutions of higher education to implement national admission policies, admission plan adjustment and implementation, and correct

behaviors that violate national admission policies and regulations.

1.5 Work load and credits

From the perspective of Chinese academic credits, the workload of students only considers contact hours. At Hunan City University, for theoretical module courses, completing 16 contact hours of study is equivalent to one Chinese credit. For experimental module courses or internship training courses, completing 32 contact hours of study is equivalent to one Chinese credit.

From the perspective of the European Credit Transfer and Accumulation System (ECTS), the workload of students is the sum of contact hours and self-study hours. Generally, 30 study hours (including contact hours and self-study hours) is equivalent to one ECTS credit. The only difference between the two credit systems lies in the calculation of self-study hours. According to the statistics of the workload of various module courses in the Chemical Engineering and Technology program, each undergraduate student must complete 6570 study hours and earn 219 ECTS credits after four years of study, which means an average of 1642.5 study hours and 54.75 ECTS credits should be completed each academic year. Document describing the conversion from credit points to ECTS credits is shown in **14_Conversion from Credit Points to ECTS_A-8**.

1.5.1 Study hours (workload), contact hours/self-study hours, credit points

Please refer to **08_Study Plan or Curricular Overview_A-4** for the study hours and credit points of each module of courses of the Chemical Engineering and Technology. Table 1-2 provides statistics on the study hours of students in four years, to show the structure and classification of the workload of General education courses, Fundamental courses of the discipline, Core professional courses, etc.

Table 1-2 Overview of study hours and credit points of the four-year program

Type of course	Contact hours	Self-study hours	Total hours	ECTS credits	Proportion of credits
General education courses	738	537	1275	42.5	19.41%

Fundamental courses of the discipline	760	620	1380	46	21%
Core professional courses	744	591	1335	44.5	20.32%
Independent development courses	352	278	630	21	9.59%
Concentration practical courses	1344	606	1950	65	29.68%
Total	3938	2632	6570	219	

1.5.2 Credit system

The learning outcomes of students are primarily reflected in the form of ECTS credits. In addition to completing the prescribed contact hours and self-study hours, obtaining ECTS credits for each course also requires meeting the assessment criteria stipulated in the course syllabus. The course assessment grades are determined by the course instructors. If a student fails to pass the assessment through examinations, retakes, or other means, they will not be awarded credits for that course. Furthermore, in cases of dropout or withdrawal, the credits previously earned will be retained by the university for four years.

Each student is required to complete approximately 820 hours of study workload per semester, with 30 hours of workload equivalent to 1 ECTS credit. The workload is relatively evenly distributed across semesters, and the credit deviation between different semesters does not exceed 2 ECTS credits to avoid significant pressure on students' learning and teachers' teaching. The detailed data on the credits and study workload for each course per semester can be referred to in the "Semester Course Schedule" (**07_Objective-Module Matrix_A-2**). The contact hours are verified by the course instructors, while the self-study hours are verified by the Student Affairs Office to ensure that the students' actual study workload is consistent with the planned workload.

1.6 Didactics and teaching methodology

Theoretical courses are mainly taught in small classes (about 50 students), some courses include theoretical content and in-class experiments, which are usually conducted in batches and groups. Optional courses can be chosen by students according to their own interests and developing needs.

In addition to theoretical and experimental teaching in the classroom, practical training and internships in the concentrated practice courses are also an essential part of the education in this major. The College of Materials and Chemical Engineering, which offers this major, has more than 10 provincial-level and above teaching and research platforms, including the Hunan Provincial Key Laboratory of All-Solid-State Energy Storage Materials and Devices, Hunan Provincial Key Lab of Dark Tea and Jin-hua, etc. These platforms support students' scientific research activities. The college has established 40 on- and off-campus practical training centers and bases, such as the basic teaching and innovation laboratories for chemical engineering and technology majors. These facilities provide excellent engineering practice conditions and ample opportunities for practical training and internships for students' concentrated practice courses. This major constructs the "double tutorial system" teaching mode under the guidance of academic tutors and enterprise tutors to help students develop their professional ability. Moreover, students can participate in major innovation projects, academic competitions, or engage in practical learning through in-house research projects led by professional teachers.

In the teaching process, this major adopts a variety of teaching methods and means, such as PBL and flipped classroom, to promote the achievement of learning outcomes. The major firmly support the student-centered teaching concept, pay attention to the integration of digital and face-to-face teaching, and balance classroom contact time and self-study time. In terms of digital teaching, the use of online platforms, multimedia resources, etc., to break the limitations of time and space, to provide personalized learning experience for students. Face-to-face teaching can enhance the interaction and collaboration ability of teachers and students through

group discussion, project-based learning, interactive lectures and other forms. The two complement each other and enrich the teaching mode.

In summary, Hunan City University has also developed a university development strategy (**04_University Development Plan_A-9**).

2 Exams: System, Concept & Organisation

2.1 Examination methods

To standardize undergraduate course assessment and enhance teaching quality, Hunan City University has formulated the "Full-time Ordinary Higher Education Undergraduate Course Assessment and Grade Management Measures" (**05_Objectives and Learning Outcomes_B-1**). Assessment is divided into examinations and evaluations. Examinations are mainly closed-book written tests, but open-book exams may be used as needed. Evaluation courses do not use closed-book exams. Exam content must cover course syllabus outcomes **(08_Study Plan or Curricular Overview_A-4**) and be explained in the Examination Question Review Form (**15_Examination Regulations_B-2**).

Courses can be assessed through oral exams, evaluations, and defenses, emphasizing learning processes. Practical components like graduation training and internships are assessed through evaluation or defense. Scores can be percentage-based or use a five-level grading system. Examination courses are mainly closed-book, with scores typically accounting for 60% of the final grade, and regular performance for 40%. This ratio can be adjusted based on course requirements.

A process evaluation mechanism must be established for regular performance, including multiple evaluation forms such as pre-class preview, classroom questioning, mid-term tests, assignments, etc. Regular performance evaluations are recorded in the "Student Academic Record Form" (**15_Examination Regulations_B-3**) and cannot be changed once determined. Self-study scores are reflected in daily grade assessments.

Course assessment results are recorded in students' files as an overall score, including regular performance and final exam scores. A total score of 60 indicates passing, and only those with a passing score can earn credits. Starting from the second semester of 2024, students with final exam scores below 45 will not be eligible for overall course evaluation based on regular performance, nor will they earn credits. The examination form and total score composition is stated in the course syllabus, so students know them upon course selection.

The assessment of student's moral character is based on the Code of Conduct, using individual summaries and democratic evaluations. Public sports are evaluated per national standards and university measures, combining regular performance (40%) and final exam scores (60%). Regular scores are based on morning running (70km to pass, 110km for full score). Final exams include free-throw shooting (30%), 1000m/800m runs (40%), and push-ups/sit-ups (30%). Public benefit labor results are judged by attendance, attitude, discipline, and task completion. Military training assessments are based on completing the teaching plan. All course evaluations use a credit point system, with grades corresponding to points as per university regulations (**Table 2-1 in 05_Objectives and Learning Outcomes_B-1**).

Table 2-1 Correspondence between assessment scores and grade points

Percentile results	Grade	Grade point	Median Grade point
90~ 100	Excellent	4.0-5.0	4.5
80~ 89	Good	3.0-3.9	3.5
70~ 79	Secondary	2.0-2.9	2.5
60~ 69	Pass	1.0-1.9	1.5
59 or below	Fail	0	0

Explanation: For those using the percentage system, an assessment score of 90 is equivalent to 4.0 GPA (Grade Point Average)), a score of 91 is equivalent to 4.1 GPA, and so on; scores below 60 are equivalent to 0 GPA. For those using the grading system, an excellent assessment score is equivalent to 4.5 GPA, a good score is

equivalent to 3.5 GPA, a passable score is equivalent to 2.5 GPA, a failing score is equivalent to 1.5 GPA, and an unpassed score is equivalent to 0 GPA.

The calculation formula of GPA is:

Grade <60, GPA = 0

Grade ≥ 60, GPA = (grade-50)/10

The calculation formula of credit points is:

The credit point of a course = the grade point × the credit point of the course

The average credit point of a semester, academic year or graduation = ∑ (credit point × course credit) / ∑ course credit

Graduation comprehensive training is a crucial phase for undergraduates to apply their knowledge and skills, learn research methods, and cultivate innovation, practicality, and entrepreneurship.

In the eighth semester, students spend 14 weeks on their bachelor's thesis/design, completing tasks independently under a supervisor's guidance, following university regulations (**02_Quality Management Handbook_B-4**). The thesis title, tasks, and schedule are detailed in the task book (**09_Module Descriptions_B-5**). Students must stay in contact with their supervisors weekly, reporting progress and issues. Supervisors provide feedback to ensure timely and accurate thesis completion. The final grade is based on instructor, evaluator, and defense panel comments, along with a performance assessment (see **09_Module Descriptions_B-6**). After completion, colleges report results to the Academic Affairs Office, conduct self-assessments, and the university organizes inspections or spot checks. All the assessment results of the courses can be viewed by students through the teaching system by using their student number and password.

2.2 Organization of the examination

Public course examinations are uniformly planned by the Academic Affairs Office, typically in the 19th and 20th weeks of each semester. Specialized courses are organized by the respective colleges, usually completing exams within two weeks

after teaching or during the term, generally before the 18th week. Exam times and locations are arranged by secondary colleges and the Examination and Student Status Management Center, with details published in the teaching management system. Exams follow the Examination Management Measures of Hunan City University (**15_Examination Regulations_B-7**), with multiple teachers grading the same exam using established answers and standards.

The same teacher corrects the same question, and papers are exchanged for review to ensure fairness. After grading, teachers analyze the papers, fill out the Paper Score Analysis Form (**16_Statistics on Grade Distribution_B-8**), and provide feedback. The Student Appeal Handling Measures (**01_Student Handbook_B-9**) are in place to ensure fair handling of appeals and protect student rights.

2.3 Course postponement, make-up and retake

In general, only students meeting school requirements can apply for deferred exams, typically three days before the exam or within one week after in special circumstances. Examination courses can't be deferred, and reapplication for deferred exams is allowed once. Deferred exam scores are based on regular grades and exam results, with credit points calculated as 1.0.

Students who failed previous semester courses (excluding practical components) can retake them in the next semester using reserve papers. Retake arrangements are made by the Academic Affairs Office, and scores are recorded based on actual results. A passing retake score earns up to 2.0 GPA points.

For failed make-up exams, students can retake unlimited times upon application and payment, with no more than 3 courses retaken per semester. Retaking can be class-based or online, following regular schedules and assessments. Passing retake exams earn corresponding credits, recorded as actual grades with "Retake" marked, see **05_Objectives and Learning Outcomes_B-1**.

3 Resources

3.1 Staff and staff development

The School of Materials and Chemical Engineering boasts a diverse and distinguished faculty, characterized by their high level of comprehensive quality and profound academic achievements. Currently, the college employs 81 teaching staff, comprising 68 full-time teachers, 15 professors, and 20 vice-senior titles. Among them, there is 1 expert who receives special government allowance from the State Council, 1 discipline leader from Hunan Province's 121 colleges and universities, 2 candidates for the Hunan Province's 121 talent project, 11 young backbone teachers from Hunan Province's colleges and universities, 1 Furong teaching teacher from Hunan Province, 4 young teachers from Hunan Province's colleges and universities, and 1 excellent experimental teacher from Hunan Province. Additionally, 58 teachers hold doctoral degrees.

3.1.1 Composition of teachers

Currently, the chemical engineering and technology specialty has established a teaching team characterized by a high academic level, a diverse subject structure, and a balanced age distribution. The team consists of 26 full-time teachers, among whom there are 7 professors, 11 associate professors, and 8 lecturers. Seventy percent of these teachers are under 45 years old, including 21 with doctoral degrees, 5 with master's degrees, and all with at least a master's degree. Additionally, there are 2 teachers with overseas experience, 1 Furong distinguished teacher from Hunan Province, 4 young core teachers from ordinary colleges and universities in Hunan Province, and 42% of the teachers have industry experience, possessing dual teaching and dual skill capabilities.

3.1.2 Development of teaching and research by teachers

Over 40 professional theoretical courses are offered in the Chemical Engineering and Technology Major, with each course being taught by a team of 2 or more lecturers. High-level teachers, all of whom hold a master's degree or above (80.8% with a doctorate), lead the professional and foundational courses. All professors are

graduates of undergraduate programs. For a detailed list of resumes of the faculty members, see **17_Staff Handbook_C-1**. In recent years, the major has undertaken 7 provincial and ministerial-level courses related to chemical engineering and technology, including 1 national first-class course, 6 provincial first-class courses, and demonstration courses, as well as 3 published textbooks. For detailed information on the provincial and ministerial curriculum construction projects, first-class courses, and teaching achievements undertaken by this specialty, please refer to **17_Staff Handbook_C-2**. In recent years, the professional teaching team has taken on 16 teaching reform and curriculum construction projects and published nearly 30 educational research and teaching reform papers. Over the past five years, professional teachers have actively guided students in participating in social practice and subject competitions. For samples of teaching and research projects undertaken by this specialty and the outcomes of these efforts, please refer to **17_Staff Handbook_C-3 and C-4**.

3.1.3 Teachers' workload

The rated workload for each professional teacher undergraduate teaching is 320 class hours per year, with actual workload requirements varying slightly depending on position and title. In addition to essential theoretical teaching, every teacher must provide students with adequate guidance, homework correction, and innovation and entrepreneurship guidance. Serving as an academic mentor and undertaking scientific innovation guidance for students in certified projects is an important reference for teacher promotion. These measures ensure that every student in the major receives adequate guidance on coursework and extracurricular assignments, aiding them in completing the courses stipulated by the training plan, acquiring the various abilities required by the major, and fulfilling the training objectives outlined in the plan.

3.1.4 Relevant training

(1) Pre-service training for new teachers: According to the requirements of the Hunan Provincial Department of Education Notice on Bettering the Pre-service

Training and Examination (Evaluation) Work for Ordinary Higher Education Teachers in Hunan Province in 2024 and other documents, all newly employed personnel engaged in educational and teaching work in higher education institutions, including full-time teachers, counselors, experimental technicians, other professional and technical personnel, administrators, and those transitioning from non-full-time teacher positions to full-time teacher positions, must participate in pre-service training organized by their institutions.

(2) Mentor system for young teachers: To strengthen the cultivation of young teachers, the college must assign a mentor with an associate professor or higher title to each newly employed young teacher, fully leveraging the role of core teachers in imparting knowledge, assistance, and guidance.

3.1.5 Related funding for teachers

Hunan City University provides research start-up funds for newly hired teachers, offering 100,000 RMB per person to young teachers with doctoral degrees. Since 2019, the university has implemented the "351 Talent Project," which includes three levels of talent programs: academic leaders, academic pioneers, and academic backbone talents, with funding amounts ranging from 160,000 to 400,000 RMB, the detailed human resources plan is shown in **18_HR Plan_C-5**.

3.2 Student support and student services

(1) The Office of Academic Affairs

The daily management and training of undergraduate teaching are mainly responsible by the Academic Affairs Office and the Teaching Quality Monitoring and Evaluation Office. The Academic Affairs Office comprises the Comprehensive Department, the Major Construction Department, the Teaching Operation Department, the Practical Teaching Department, and the Student Record Management and Examination Center. The website of school teaching management information system is http://58.47.143.9:6038/jwglxt/xtgl/login_slogin.html. Each faculty and staff can log in with their account passwords, those without cannot.

(2) Student Affairs Department (Office)

The Student Affairs Office of Hunan City University is a functional department responsible for student management, education, and service. Its main responsibilities include: verifying students' self-study hours, implementing ideological and political education, legal education, school discipline education, and mental health education for students, and promoting academic atmosphere construction, comprehensive quality assessment, scholarship and financial aid evaluation, hardship assistance, and dormitory management. The Student Affairs Office has established a comprehensive counselor system to carry out ideological education, cultivate party and league cadres, guide class construction, help students develop good study habits, provide mental health consultation and career planning services, encourage students to seek employment and start businesses at the grassroots level, organize social practice and volunteer activities, and cultivate students' sense of social responsibility and spirit of dedication, thereby promoting the comprehensive development of students.

(3) Academic mentors

In the field of Chemical Engineering and technology, each undergraduate student is assigned a dedicated academic mentor. The primary responsibility of the academic mentor is to help students clarify their academic goals and develop personalized study plans. By considering the students' foundation, interests, and career plans, the advisor guides them in arranging their course studies in a reasonable manner. This ensures that students not only master the fundamental theories but also delve into the cutting-edge areas of the major. In terms of professional knowledge and skill development, the academic mentor will make full use of laboratory resources to guide practical operations and project development. They will also organize student's participation in research projects, innovative experiments, and academic competitions to cultivate their innovative thinking and teamwork skills. At the same time, the mentor will provide employment information and job-seeking skills based on industry development trends, helping students to develop practical career plans.

(4) Corporate mentors

The university has implemented a corporate mentorship system, which provides the students with practical platforms closely aligned with the industry to stimulate their innovative thinking and entrepreneurial potential. Corporate mentors are managers or engineers from relevant enterprises certified by Hunan City University. The selection of corporate mentors follows a two-way principle between students and mentors. Students can choose their preferred corporate mentors based on their research interests, and corporate mentors can also select students. Most of the concentrated practical courses in this major are collaborative practice segments between the university and enterprises. During the concentrated practical courses and corporate internships, corporate mentors are responsible for guiding students' projects, maintaining communication with the academic mentors from the university, and engaging in collaborative teaching to develop students' experimental skills, engineering application capabilities, and innovative practical abilities.

(5) Course website

Online teaching is an essential component of the teaching activities in this major, and online course learning accounts for a portion of students' self-study hours. The online course resources for this major are mainly concentrated on the school’s official online course teaching platform (https://hncu.mh.chaoxing.com), Yuketang (https://hncu.yuketang.cn/pro/portal/courselist), and Ketangpai (https://www.ketangpai.cn/#/homePage). These online platforms integrate a variety of course resources, allowing students to access detailed course web pages simply by logging in. Students can find course-related information on the websites and engage in online communication with instructors, which helps them gain a deeper understanding of the course content. At the same time, it enables instructors to more accurately grasp students' learning progress, thereby adjusting their teaching strategies and improving the quality of teaching.

(6) Transfer of specialty within the university

To grant students greater autonomy and choice their studies and to fully reflect the student-centered educational philosophy, the "Hunan City University Regulations

for Full-time Undergraduate Students to Change Majors" (see **05_Objectives and Learning Outcomes_C-6**) has been formulated. This regulation aims to provide maximum convenience for students to change majors, considering the existing teaching resources and conditions of the university and colleges. The major change process is primarily targeted at first-year undergraduate students. Students can only change their major once during their studies, and once the application for a major change is approved by the university, it cannot be altered.

A Major Adjustment Review Group has been established by the university to handle matters related to major changes. The specific process includes: ① Student application; ② Participation of the major change examination or assessment after the completion of the first semester of the first year at university;③ Preliminary review of the list of students intending to change majors by the Academic Affairs Office; ④ Review by the university leadership in charge of undergraduate teaching; ⑤ Public announcement by the Academic Affairs Office; ⑥ Approval by the President Office; ⑦ Processing of major adjustment procedures. After changing majors, students will be strictly assessed for graduation qualifications according to the talent training program of the new major. Credits already obtained that meet the requirements of the new major's talent training program should be recorded on the "Hunan City University Credit Recognition Application Form for Students with Academic Changes" (see **05_Objectives and Learning Outcomes_B-1**). These credits will be recognized after confirmation by the new college and submission to the Academic Affairs Office. For courses that have already been completed by the new major but not yet taken by the student, the credits must be obtained through retaking the courses.

(7) Abroad and Internship

To broaden student's international perspectives and enhance their comprehensive qualities and career competitiveness, the university encourages and supports undergraduate students to actively participate in overseas exchange, study abroad, and internship programs. All overseas programs are uniformly managed by the

university's Office of International Cooperation and Exchange. Sign a cooperation agreement initiated by the school (**03_Cooperation Agreement_C-7**). Any independent arrangements for overseas study or exchange must be approved by the Office of International Cooperation and Exchange. Students selected for exchange programs maintain their student status at our university during their study abroad. For details on the recognition principles of examination results and credits, please refer to the "Hunan City University Regulations on Student's Overseas Study and Internship" (see **05_Objectives and Learning Outcomes_B-1**).

3.3 Funds and equipment

3.3.1 Teaching investment in the past five years

The teaching funds for the Chemical Engineering and technology major are adequately guaranteed, with annual increases in basic business expenses for undergraduate teaching, teaching construction, student innovation and practical activities, and teaching reform projects, ensuring normal teaching activities with sufficient teaching funds. Over the past five years, the total investment in the professional teaching funds has reached 10.94 million RMB (**21_Student Support and Student Services_C-8**).

3.3.2 Sufficient infrastructure

Hunan City University and School of Materials and Chemical Engineering provide the sufficient infrastructure in terms of both quantity and quality.

(1) Laboratory

To ensure the normal and efficient conduct of undergraduate teaching experiments, the college has formulated a complete experimental teaching management system based on the school's rules and regulations. The relevant management system documents are detailed in **21_Student Support and Student Services_C-9 and C-10**. The director of the experimental center is responsible for organizing, implementing, and inspecting the execution.

The total laboratory area exceeds 5,000 square meters, and the total value of

instruments and equipment surpasses 20 million yuan. Furthermore, the college has established more than 40 stable off-campus internship and employment bases, including chemical principle laboratories, chemical reaction engineering laboratories, catalyst preparation and evaluation laboratories, chemical process laboratories, chemical professional laboratories, and chemical virtual simulation laboratories, etc. Various types of experimental teaching equipment are worth tens of millions, and the infrastructure necessary for students to meet graduation requirements is fully guaranteed; there is a good management, maintenance, and update mechanism so that students can use it conveniently; there are special experimental management personnel to ensure that experimental teaching meets teaching requirements. Please see **21_Student Support and Student Services_C-11** for the list of major laboratories.

(2) Subject construction points and research platforms

The Chemical Engineering and Technology majors are taking full advantage of the significant opportunities presented by the vigorous implementation of the province's "three highs and four new" strategy. They are reinforcing the construction of scientific and technological innovation platforms, leveraging their inherent strengths, seeking a distinctive path to survival, developing their strengths and addressing their weaknesses. They are continuously striving to become stronger and better, aiming to provide robust scientific and technological support for the regional economic and social development. Over the course of 19 years of educational endeavors, the professional construction has been deepened, its characteristics have become increasingly pronounced, and the conditions have gradually improved. The majors have achieved provincial and higher quality engineering platforms, such as the "Hunan Provincial Key Laboratory of All-Solid-State Energy Storage Materials and Devices" For more details, please refer to Table 5-1.

Table 5-1 Quality engineering platform at provincial level and above for this specialty

Serial number	Platform name	Category to which it belongs	Year of approval
1	Characteristic Disciplines of Application in the 14th Five-Year Plan of Hunan Province	Discipline Construction	2022

	(Chemical Engineering and Technology)		
2	Hunan Province double first-class application characteristic Discipline (Chemical Engineering and Technology)		2018
3	First-class Undergraduate Program of Hunan Province (Chemical Engineering and Technology)	Major Construction	2019
4	Specialty of Hunan Province (Chemical Engineering and Technology)		2008
5	Key Major of Hunan Province (Chemical Engineering and Technology)		2006
6	Key Laboratory of Low Carbon and Environmental Functional Materials	Laboratory Construction	2023
7	Hunan Provincial Key Laboratory of all-solid State Energy Storage Materials and Devices		2017
8	Hunan Provincial Key Lab of Dark Tea and Jin-hua		2016
9	Exploration and practice of new engineering construction of All-dimensional and multi-subject chemical materials	Practical Teaching	2024
10	Hunan Province Chemical Practice Teaching Demonstration Center		2008

Over the past five years, professional teachers have actively guided students to participate in social practice and discipline competitions. He has secured 111 awards at the provincial level and above in various competitions, including the China International "Internet +" College Student Innovation and Entrepreneurship Competition, the "Challenge Cup" Chinese College Student Entrepreneurship Plan Competition, the "Tianzheng Design Cup" National College Student Chemical Design Competition, the "Challenge Cup" Hunan College Student Entrepreneurship Plan Competition, the South-Central Region University Chemical Principle Competition, and the Hunan College Student Chemical Engineering Discipline Competition. Additionally, 3 national college student innovation projects and 18 provincial college student innovation projects have been established. For details of participating projects and awards, please refer to **21_Student Support and Student Services_C-12**.

This major emphasizes local characteristic resources and advantageous industries, ADAPTS to the development needs of the industry in the new era, focuses on the cultivation of students' engineering literacy and practical ability, and possesses strong

employment competitiveness and innovation and entrepreneurship ability in the fields of "fine chemical industry" and "biological chemical industry".

(3) International exchange and cooperation platform

In recent years, the College of Chemical Engineering and Technology has attached great importance to the implementation of the "international exchange" strategy, aiming at forefront and strengthening international cooperation. In May 2024, the School of Material and Chemical Engineering jointly organized the "2024 Green Intelligent Quality: Urban Construction and Development" International Academic Conference on Artificial Intelligence and Urban Development with the University of Cape Coast in Ghana.

(4) Library and information resource platform

Currently, the Hunan City University Library houses over 2.845 million volumes of Chinese and foreign printed documents, nearly 400 types of Chinese and foreign printed journals, and nearly 9.75 million theses and doctoral dissertations. It also has Chinese and foreign language databases, academic journals, et al, which are shown in **21_Student Support and Student Services_C-13**. In addition, the relevant management files of the library and Lectures organized by the library for students are listed in **21_Student Support and Student Services_C-13**.

(5) Teaching and office facilities

The College of Materials and Chemical Engineering houses a first-level public library situated in Room 308 of the Chemical Engineering Building, spanning an area of approximately 116 square meters. The library boasts a collection of 26,600 Chinese language volumes and 3,600 foreign language volumes. It encompasses a range of subjects including the General History of the Chemical Industry of China, the China Petroleum and Chemical Industry Business Manual, Fine Chemical Product Technology, the Basis of Chemical Equipment Design, Chemical Process Development and Design, the Development Report of China Chemical New Materials Industry, Chemical Instrumentation and Automation, and other cutting-edge information. This collection largely satisfies the professional requirements of its

patrons. Books are regularly updated to keep pace with students' daily learning needs. The reading room, managed by the college, is open for extended hours. Both teachers and students can enter the reading room freely after registering, and it is equipped with tables and chairs for on-site reading.

(6) Barrier-free facilities

All newly built laboratories, classrooms and office buildings are equipped with barrier-free facilities so that disabled students can enter these teaching places smoothly. In short, to meet the needs of educational informatization, the school has comprehensively constructed a safe, efficient, scalable, and open information-based campus infrastructure, achieving full coverage of wireless networks in public areas within the school, realizing functions such as networked administrative offices, teaching informatization management, and resource sharing, thus meeting the needs of student's learning, teacher's instruction, and research work.

(7) Other external cooperation

The profession of chemical engineering and technology continuously optimizes the direction of the discipline, strengthens the cooperation and exchange between schools and enterprises, and has established good school-enterprise cooperation relations with Huawei, China Unicom, China Telecom and other professional counterparts. The list of off-campus cooperative enterprises and off-campus partners of this major is listed in **21_Student Support and Student Services_C-14**.

4 Transparency and Documentation

4.1 Module descriptions

The college provides a comprehensive and efficient personal management system for department heads, faculty, and students, aiming to promote interconnectivity in work scheduling, processing, modification, and information dissemination. This system offers a wide range of targeted functional modules based on different user roles. Faculty, students, and college administrators can achieve

smooth communication and feedback through the system. This interactive mechanism ensures the effective transmission of opinions from all parties, promoting information flow and decision optimization within the university.

For teachers, the system not only supports timetable inquiries and student list views but also allows teachers to record students' grades manage graduation thesis/designs and has practical functions such as class scheduling. These tools greatly simplify daily teaching management work helping teachers focus more on improving educational quality. Student users can query their own schedules and grades through the system and participate in the management of graduation thesis/designs. Such design not only facilitates students to timely understand their learning status but also provides strong support for their academic planning.

Users can easily access the personal management system through the "Portal Entry" in the top navigation bar of the homepage of the official website of the college. The portal login interface design is intuitive and a model of user-friendly service. On the unified identity authentication platform users need to input accurate account numbers and passwords (student accounts are their student ID numbers while teacher accounts are staff numbers) and complete SMS verification to ensure account security. In addition, the system also supports a more convenient and secure QR code login option, further enhancing the user experience.

For users who may encounter login difficulties, the page specifically provides a "Forgot Password" feature, detailing the steps to recover account information ensuring that every user can smoothly resolve account access issues. This series of thoughtful designs not only demonstrates attention to user needs but also showcases the commitment to providing efficient, secure, and convenient online services.

4.1.1 Teacher personal management system

The first thing that catches the eye is a carefully designed new finger guide function, which undoubtedly greatly facilitates the first-time user. After completing the novice guide, the teacher will enter the main interface.

The "System Express" function located in the center of the interface provides a one-click shortcut to several important modules including the Academic Affairs System and Practical Teaching. Through the Academic Affairs System, teachers can not only query various teaching-related data and information but also perform a series of operations and management tasks; in the Practical Teaching module, it is convenient to handle matters related to graduation thesis/design, greatly simplifying the workflow and improving work efficiency, fully demonstrating the colleges relentless pursuit of enhancing teaching quality and service levels.

4.1.2 Student personal management system

The following is the interface that students see after logging in successfully. The personal interface is designed with great humanization, aiming to provide each student with a convenient and efficient service experience. This interface is mainly divided into two modules: the Personal Service Window and the System Express Window. Through these two carefully designed windows, not only is the interaction between students and the university strengthened, but it also significantly enhances student satisfaction and campus quality of life.

The Personal Service Window integrates a series of functions closely related to individual students, such as examination information, grade inquiry, etc., aiming to enable students to easily manage their learning lives and stay updated on their academic progress. The System Express Window focuses more on providing a rapid channel for accessing university resources and services, such as the Academic Affairs System, enabling students to quickly obtain the information they need or complete specific operations, significantly improving efficiency and the convenience of campus life.

4.1.3 Credit and workload

Each student must earn 219 ECTS credits to graduate. Students who fail courses will be recorded. For students who fail the exams, the university will provide opportunities for retaking exams or retaking courses (see **05_Objectives and**

Learning Outcomes_B-1). Students who do not complete 219 ECTS credits will not be able to obtain a degree. For students with learning difficulties, the university has established facilities and environments suitable for students with disabilities, including accessible restrooms and ramps to facilitate their learning.

4.1.4 Test score evaluation and continuous statistics

Teachers are required to submit students' examination results and course teaching analysis after each course examination and propose feasible suggestions for continuous improvement based on the analysis results to enhance teaching quality and student learning results. If students fail the course examination, a dedicated academic advisor will be assigned to supervise and guide their course studies.

4.1.5 Student admission assessment

Since 2020, the admission score line of Hunan City University has consistently been higher than the standard for the first-tier universities in the National College Entrance Examination (college entrance examination). For detailed information and admission records over the past five years, please refer to **11_Admission Rate Statistics_D-1**. The university of Materials and Chemical Engineering strictly adheres to the relevant regulations stipulated by the Ministry of Education of the Peoples Republic of China, the Hunan Provincial Department of Education, and the Hunan Provincial Education Examination Institute in its recruitment and admission work, and has established a dedicated recruitment leadership group to oversee all recruitment matters comprehensively. For detailed information on the regulations for Hunan City University's recruitment and admission work, the implementation details of recruitment publicity and supervision, the rules for recruitment examination work, and the system of conflict interest avoidance, please refer to **10_Admission Regulation_A-5** to **10_Admission Regulation_A-7**.

4.1.6 Further development and continuous improvement

To meet the demands of the job market and technological development, College

of Materials and Chemical Engineering of Hunan City University places great emphasis on the continuous development of its programs. The college continuously explores innovations and has introduced a series of supporting management systems to adapt to the rapidly changing industry needs. For this purpose, Hunan City University has established a specialized graduate tracking information system aimed at collecting and analyzing feedback from graduates to understand their performance and development in the workplace. Additionally, the college holds annual alumni seminars during its anniversary celebrations to create a platform for communication and interaction with graduates, promoting the continuous improvement of the curriculum and enhancing teaching quality.

Considering the language barriers that some international students or non-native Chinese students may encounter during their studies, the university of Materials and Chemical Engineering will further enhance the bilingual teaching capabilities of professional teachers, increase the number of bilingual courses, and strengthen Chinese language training for international students to help them adapt to the campus life and learning environment of Hunan City University as soon as possible, ensuring that every student can receive a high-quality educational experience.

4.2 Diploma and diploma supplement

05_Objectives and Learning Outcomes_D-2 shows a sample of the graduation certificate and bachelor degree certificate for students graduating from the Chemical Engineering and technology program at Hunan City University, and all certificates must be stamped with the official seal of Hunan City University and signed by the president to take effect. **05_Objectives and Learning Outcomes_D-3** depicts a supplementary diploma sample.

4.3 Relevant rules

4.3.1 Teaching evaluation system

To regulate the preparation of lesson plans, lecture notes and other preparations for teachers, as well as the conduct of teaching and other related work, Hunan City

University has formulated a set of rules and regulations and conducts strict qualification examinations for teachers, which are listed in **02_Quality Management Handbook_D-4**.

The University's Academic Affairs Office regularly implements tripartite (student/peer/supervisor) evaluation of courses, and the results are summarized and fed back by the faculty and incorporated into the instructional system available for review, as detailed in **02_Quality Management Handbook_D-5**.

4.3.2 Further development and continuous improvement

The College of Materials and Chemical Engineering builds a dynamic professional optimization mechanism, implements a graduate tracking information management system, and holds regular alumni talks to promote iterative upgrading of teaching to buttress the demands of the job market and technological development. By collecting data on workplace performance and feedback from various parties, the curriculum system and training programmers are continuously improved.

The College of Materials and Chemical Engineering will further enhance the bilingual teaching capabilities of professional teachers, increase the number of bilingual courses, and strengthen Chinese language training for international students to help them adapt to the campus life and learning environment of Hunan City University as soon as possible, ensuring that every student can receive a high-quality educational experience.

5 Quality Management: Quality Assessment and Development

5.1 Internal teaching quality evaluation

Each semester, under the unified arrangement of the university, each college and each major will implement routine teaching inspections to evaluate the quality of teaching through classroom instruction, practical activities, thesis/design process, teaching order, lesson plans, examination papers, and other teaching materials. This process aims to identify and address potential issues in teaching management. Taking the examination paper inspection as an example, at the beginning of each semester, the Academic Affairs Office of Hunan City University conducts random checks on the examination papers from the previous semester and evaluates them from three aspects: examination paper scores, paper analysis, and improvement measures, to promote the standardization of examination papers. Each semester, the college analyzes the distribution of examination scores and student performance, and provides suggestions and requirements for improving teaching quality to teachers, detailed information is provided in the "Hunan City University Full-time Ordinary Higher Education Undergraduate Course Assessment and Grade Management Measures" (**05_Objectives and Learning Outcomes_B-1**).

5.2 External teaching quality evaluation

The university adopts a system of feedback from student employers to listen to their opinions. In addition, the university has introduced external supervision, for example, the university has participated in the undergraduate teaching evaluation of higher education institutions initiated by the Ministry of Education of China and the excellent undergraduate course evaluation organized by the Hunan Provincial Education Commission, forming a teaching quality evaluation mechanism that combines internal and external evaluations with the participation of higher authorities, employers, teachers, and students. Here, the role of the Ministry of Education, employers, external experts, and third-party society is seen as external evaluation (see

in **02_Quality Management Handbook_E-1**: "Third-party Social Evaluation Implementation Plan (Trial))"; and the power of teachers and students and the university itself is acted as internal evaluation. The practical application results show the effectiveness of this evaluation method.

5.3 Tool methods and data

5.3.1 Number of students and graduation rate

According to the average class hours stipulated by Hunan City University: the normal study period for students is 4 years, but does not exceed 6 years, students who cannot graduate within 6 years will receive a certificate of suspension or be dismissed. **Table 5-1** lists the number of students and graduates for this program from 2020 to 2024. The beginning and ending time of each spring semester and autumn semester are basically the same, thus the annual schedule is determined. The destinations of graduates from this major are shown in **Table 5-1**.

Table 5-1 Destinations of Major Graduates

The years	2020	2021	2022	2023	2024
Number of students	65	64	97	110	99
Number of graduating students	64	61	93	109	94
Graduate ratio	98.46%	95.31%	95.88%	99.09%	94.95%
Graduate employment ratio	82.81%	70.49%	78.49%	63.30%	61.70%
Proportion of graduates who continue their studies in China	15.63%	26.23%	19.35%	30.28%	35.11%
Other graduates	1.56%	3.28%	2. 16%	7.42%	3.19%

5.3.2 Students evaluation of teaching quality

Student teaching quality evaluation is an important component of the teaching evaluation system. Each student must submit a teacher teaching quality evaluation form before selecting courses each semester, otherwise they will not be able to select courses. The teaching suggestions listed in the evaluation form will be analyzed and used to improve teaching methods. Student evaluations of teachers are also used to assess teaching effectiveness and are linked to teacher’s job performance. The

evaluation results of peer, supervisory, and student evaluations in the past three years are shown in the implementation plan for third-party social evaluations is shown in **02_Quality Management Handbook_E-1.**

5.4 Feedback channels

Through surveys of graduates, industry companies, focus group discussions, site visits, and third-party evaluations, continuous improvements are made in various aspects of the program, including the training objectives, graduation requirements, course structure, and teaching activities. A graduate tracking feedback mechanism and a social evaluation system have been established. Every 2-4 years, the achievement of the training objectives is analyzed through regular assessments.

5.4.1 Graduate tracking and feedback mechanism

(1) Responsible Institution: The Admissions and Employment Office of the university formulates the social evaluation mechanism based on the overall development needs of the university. The graduate tracking survey work is organized by the department head, and is implemented through surveys, visits, and other forms of communication. The collected materials are then summarized and analyzed.

(2) Work cycle: Once per year.

(3) Target group:

① Students who graduated 1-5 years ago: The survey coverage should reach at least 50% of the graduating class for that year.

② Students who graduated more than 5 years ago: Representative survey subjects should be selected, taking into account differences in geographic location, types of companies, job roles, etc.

(4) Method: The survey is conducted through interviews, focus groups, online platforms, mail, telephone, and other methods, or through alumni meetings, campus visits, and other opportunities to hold alumni discussion sessions.

(5) Information collected: The survey covers analyses of graduates' qualifications during their studies, career choices, evaluations of current jobs and positions, and

assessments of how their education has influenced their career development.

5.4.2 Graduate social evaluation mechanism

(1) Responsible department: The university's Admissions and Employment Office develops the social evaluation mechanism according to the university's overall development needs. The graduate tracking survey is organized by the department head and is specifically implemented through surveys, visits, and discussions, with relevant data being compiled and analyzed.

(2) Evaluation cycle: The survey is conducted once every 2-4 years, while visits and discussions are carried out on an irregular basis.

(3) Evaluation methods: Employer surveys, employer focus groups, recruitment company discussions, and industry expert focus groups.

5.5 Further development and continuous improvement

The Chemical Engineering and technology major has established a complete set of process quality management and assurance measures from course objectives to graduation requirements, and then to training objectives. The first is the quality monitoring and continuous improvement of course teaching. In this process, the college teaching guidance committee reviews the teaching outline before class, the teacher's own formative evaluation is conducted during class, and after class, there are evaluations or questionnaires from supervisors, peers, and students on the course; The second is a questionnaire targeting the graduation requirements of fresh graduates, used for continuous improvement of the curriculum system; The third is to conduct on-site visits to previous graduates and employers to conduct a comprehensive survey questionnaire on training objectives, in order to continuously improve graduation requirements and curriculum systems; The fourth aspect is to provide feedback on the comprehensive graduation requirements and training objectives, and to continuously improve issues such as laboratory and faculty based on the characteristics of the curriculum system and each course. The process is shown in Figure 5-1.

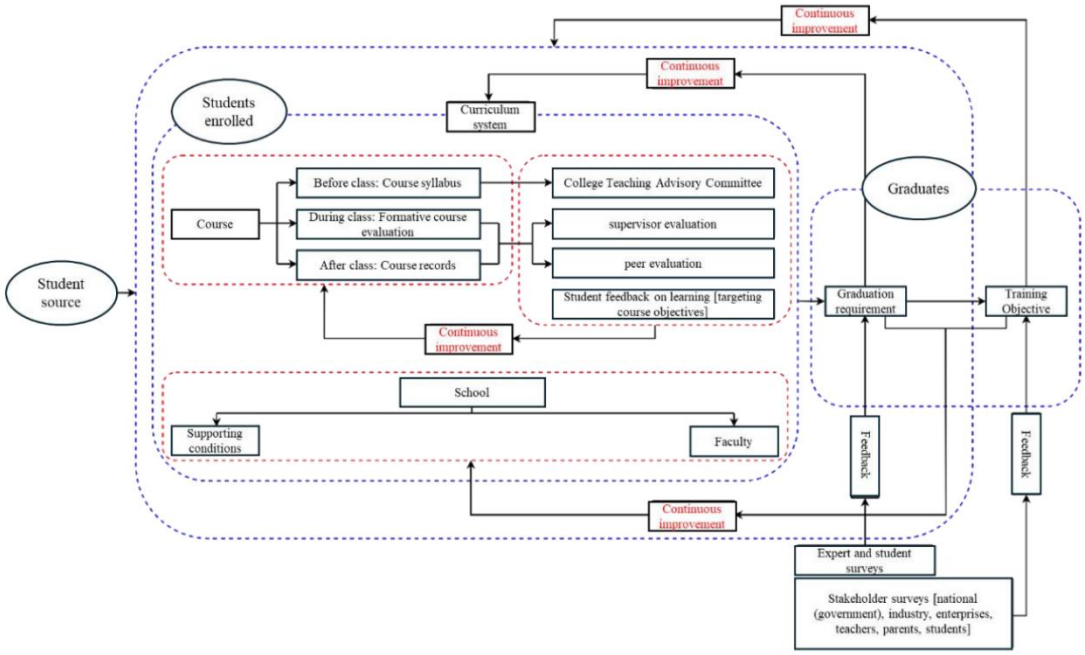

Figure 5-1 Quality Monitoring and Continuous Improvement Process Diagram

5.6 Effects achieved after implementing quality assurance measures

(1) Improvement in graduate competency development

Through the continuous improvement of the training objectives, graduation requirements, curriculum structure, and course goals, the graduation competencies of the students in this program have been strengthened, and the quality of talent cultivation has improved. The graduates have enhanced their ability to apply relevant background knowledge of chemical engineering to propose reasonable solutions, considering their impact on society, health, safety, law, and culture, and taking on corresponding social responsibilities.

(2) Improvement in graduate employment quality

Through continuous improvement, graduates from this program not only possess a solid theoretical foundation and rich practical experience, but also embody a spirit of unity, friendship, collaboration, and innovation. This enables them to have a broad range of career options and a high employment rate. In recent years, the proportion of graduates entering well-known enterprises has gradually increased.

(3) High overall quality and broad development prospects of graduates

Employers generally report that graduates of this program have a solid foundation in both basic and professional knowledge, demonstrate a rigorous and serious work ethic, and possess strong hands-on and practical skills, enabling them to perform well in technical roles related to their field. After five years, many graduates have become technical backbones or engineering managers. Students exhibit strong self-learning abilities and an awareness of lifelong learning, allowing them to follow industry developments, acquire new professional knowledge.