MINISTRY OF EDUCATION & TRAINING
NAM CAN THO UNIVERSITY

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

UNDERGRADUATE PROGRAM
CHEMICAL ENGINEERING TECHNOLOGY

(Issued according to Decision No: /QĐ-ĐHNCT dated day month year 2025 of The Rector of Nam Can Tho University)

Name of program: **Engineer of Chemical Engineering Technology**
Level: **Undergraduate**
Major: **Chemical Engineering Technology**
Code: **7510401**
Type of education: **Full-time**

1. Program Description

1.1. Introduction

The Chemical Engineering Technology program trains engineers with adequate knowledge, skills, political and ethical qualities, professional demeanor, and good health to effectively work in fields related to chemical engineering technology, pharmaceutical chemistry, research and development of natural compounds, chemical cosmetics, and new chemical products; as well as operation, supervision, and design of chemical production processes.

1.2. General information about the training program

Program Name (Vietnamese)	Công nghệ kỹ thuật hóa học
Program Name (English)	Chemical engineering and technology
Training Code	7510401
Degree Awarding School	Nam Can Tho University
Degree Name	Engineer in Chemical Engineering
Training Level	Undergraduate
Required Credits	156
Training Form	Full-time
Training Duration	4 years
Admission Target	High school graduates
Assessment Scale	4
Graduation Requirements	- Accumulate enough credits and volume of the training program to reach 150 credits; - The average cumulative score of the entire course is from 5.0 or higher; - Meet the output standards for English and IT proficiency according to the general regulations of the

	School; - Meet the output standards for Soft Skills and Professional Skills; - Have a National Defense - Security Education certificate and complete the Pre courses.
Job Position	- Design, operation and technical management engineers in the fields of chemistry, food, environment, ...; - Laboratory staff, product quality inspection and assessment technicians; - Product research and development staff; - Participate in teaching at research institutes and educational institutions; - Analytical staff at analysis and testing centers, resource and environmental monitoring centers; - Business and entrepreneurship.
Advanced Education	After graduating, Chemical Engineering engineers can study for another university degree in the same field or continue to study for a master's degree or doctorate at domestic and foreign institutes/universities. In addition, Chemical Engineering engineers will be trained to have lifelong learning skills.
Reference Program	Undergraduate training program in Chemical Engineering Technology Can Tho University, Can Tho University of Technology and Engineering, Ho Chi Minh City University of Food Industry, Nha Trang University and foreign universities
Update Time	06/2024

1.3.1. General Objectives

To train engineers specializing in Chemical Engineering Technology who possess solid expertise in science and technology, systematic thinking methods, strong foundational and technical knowledge, high-level professional expertise, proficient practical skills, independent and creative scientific research capabilities, teamwork and collaboration skills, and the ability to adapt to socio-economic environments. Graduates will be equipped to effectively solve scientific and technical problems in the field of Chemical Engineering Technology.

1.3.2. Specific Objectives

- **M1:** Master foundational knowledge of General Chemistry, Inorganic Chemistry, Analytical Chemistry, Organic Chemistry, Physical Chemistry, and

core knowledge in Chemical Engineering Technology and production engineering.

- **M2:** Have the ability to research, design, and apply new chemical technologies. Capable of conducting pilot-scale production and quickly adapting to new and modern knowledge.
- **M3:** Be capable of conducting scientific research, possess creative thinking, leadership, independent working skills, and organizational implementation capabilities. Graduates will be qualified to work in research centers, institutes, companies, and manufacturing facilities, or to teach at universities, colleges, and vocational schools. They are also prepared for postgraduate education.
- **M4:** Possess strong practical skills and be proficient in using modern equipment for scientific research and production. Capable of applying and implementing chemical engineering technology in real-world contexts.
- **M5:** Be proficient in English for communication and professional purposes.
- **M6:** Demonstrate good moral character, a commitment to national development and defense, a passion for science, self-discipline for continuous improvement in political and professional competence, confidence and integrity, and a strong sense of responsibility to meet the demands of industrialization, modernization, and international integration.

2. Duration of Study: 4 years

3. Total Program Credits: 156 credits (excluding credits for Physical Education and National Defense Education), distributed as follows:

KNOWLEDGE BLOCK	Knowledge Required	Ele knowledge	Total
General education knowledge	**58**	**2**	**60**
Professional education knowledge	**77**	**19**	**96**
- Basic industry knowledge	35	9	44
- Specialized knowledge	38	4	42
- Graduation internship	4		4
- Graduation thesis/Replacement subjects		6	6
Total volume	**135**	**21**	**156**

4. Admission Requirements

Based on results from the National High School Graduation Exam or high school academic records (GPA) evaluated according to subject groups related to the major, applicable nationwide.

5. Training Process and Graduation Requirements

5.1. Training Process

Implemented in accordance with the regulations for full-time undergraduate and college programs under the credit-based system as currently applied by Nam Can Tho University.

5.2. Graduation Requirements

- Students must complete all training program requirements and be approved for graduation as per Article 27 of the credit-based education regulations;

- Meet English and IT competency standards set by the university (IT skills include Modules 01 to 06 under Circular 03/2014/NO-BNONO);

- Obtain certificates in National Defense Education, Physical Education, Soft Skills, and Professional Skills;

- Evaluation of partial and final course grades follows Articles 22 and 23 of the education regulations;

- Annual and graduation rankings follow Articles 14 and 28 of the credit-based system.

6. PROGRAM CONTENT

6.1. General Education Knowledge:

No	Course code	Course name	Number of credits	Theory	Practice	Category
A	**Political theory**		**11**			
1	0101000889	Marxist-Leninist philosophy	3	3		Comp
2	0101000641	Marxist-Leninist Political Economy	2	2		Comp
3	0101000890	Scientific socialism	2	2		Comp
4	0101000900	Ho Chi Minh's Thought	2	2		Comp
5	0101000869	History of the Communist Party of Vietnam	2	2		Comp
B	**Social sciences and humanities**		**2+2**			
6	0101000891	General law	2	2		Comp
7	0101000881	General logic	2	2		Ele
8	0101001141	Environment and People	2	2		Ele
9	0101000903	General Sociology	2	2		Ele
C	**Foreign languages**		**21**			
10	0101000861	Basic English 1	3	3		Comp
11	0101000862	Basic English 2	3	3		Comp

No	Course code	Course name	Number of credits	Theory	Practice	Category
12	0101000863	Basic English 3	3	3		Comp
13	0101000864	Basic English 4	3	3		Comp
14	0101000865	Basic English 5	3	3		Comp
15	0101001881	English for Chemical Engineering Technology 1	2	2		Comp
16	0101001882	English for Chemical Engineering Technology 2	2	2		Comp
D	**Mathematics, Information Technology, Natural Sciences**		**24**			
17	0101000256	General Chemistry	2	2		Comp
18	0101001361	General Chemistry – Practical	1		1	Comp
19	0101000892	General Biology	2	2		Comp
20	0101000957	General Biology – Practical	1		1	Comp
21	0101000898	Advanced Mathematics 1	3	3		Comp
22	0101000902	General Physics	2	2		Comp
23	0101000960	General Physics – Practical	1		1	Comp
24	0101000896	Basic Computer Science	3	2	1	Comp
25	0101000883	Probability Theory and Mathematical Statistics	3	3		Comp
26	0101000897	Artificial Intelligence Applications - AI	2	1	1	Comp
27	0101000898	Digital Transformation	2	2		Comp
28	0101000898	Startups and Innovation	2	2		Comp
E	**Physical Education**		**3**			
29	0101000872	Physical Education 1 (*)	1		1	Pre
30	0101000873	Physical Education 2 (*)	1		1	Pre
31	0101000874	Physical Education 3 (*)	1		1	Pre
F	**National Defense Education**		**8**			
32	0101000871	National Defense Education (*)	8			Pre

(*) Pre subjects, not calculated for cumulative GPA

6.2. ***Volume of professional education knowledge:***

No	Course code	Course name	Number of credits	Theory	Practice	Category
Basic knowledge of the industry			**35+9**			
1	0101000269	Analytical Chemistry	2	2		Comp
2	0101000270	Analytical Chemistry – Practical	1		1	Comp
3	0101000077	Drawing & Technical Drawing	3	3		Comp
4	0101000282	Introduction to Chemical Engineering Technology	2	2		Comp
5	0101000259	Innovation and Entrepreneurship	2	2		Comp
6	0101001884	Inorganic Chemistry	2	2		Comp
7	0101001885	Inorganic Chemistry – Practical	1		1	Comp
8	0101001886	Organic Chemistry	2	2		Comp
9	0101001887	Organic Chemistry – Practical	1		1	Comp
10	0101001888	Physical Chemistry 1	2	2		Comp
11	0101001889	Physical Chemistry 1 – Practical	1		1	Comp
12	0101001890	Physical Chemistry 2	2	2		Comp
13	0101001891	Physical Chemistry 2 – Practical	1		1	Comp
14	0101001892	Analytical Chemistry 2	2	2		Comp
15	0101001893	Analytical Chemistry 2 – Practical	1		1	Comp
16	0101001894	Occupational Safety in Chemical Technology	1	1		Comp
17	0101001895	Engineering – Reactors	3	3		Comp
18	0101001896	Heat Transfer Processes and Equipment	2	2		Comp
19	0101001897	Mass Transfer Processes and Equipment	2	2		Comp
20	0101001898	Process and Equipment Projects	1		1	Comp
21	0101001899	Cognitive Practice	1		1	Comp
22	0101001882	Calculation method	3	3		Ele
23	0101001883	Experimental planning	3	3		Ele

No	Course code	Course name	Number of credits	Theory	Practice	Category
24	0101001900	Materials	2	2		Ele
25	0101001901	Measurement Techniques	2	2		Ele
26	0101001902	Basic Design of Chemical Plants	2	2		Ele
27	0101001903	Polymer Chemistry	2	2		Ele
28	0101001904	Atomic Spectroscopy	2	2		Ele
29	0101001905	UV-Visible Spectroscopy	2	2		Ele
30	0101000099	Electrical Engineering and Electrical Safety	2	2		Ele
Specialized Knowledge			***38+4***			
31	0101001906	Biochemistry & Food Microbiology	2	2		Comp
32	0101001907	Organic Synthesis Technology	3	3		Comp
33	0101001908	Detergent Production Technology	3	3		Comp
34	0101001909	Detergent Production Technology - Practice	1		1	Comp
35	0101001912	Petroleum Chemistry & Oil Refinery Technology	3	3		Comp
36	0101001913	Pharmaceutical Chemistry	2	2		Comp
37	0101001914	Pharmaceutical Chemistry - Practice	1		1	Comp
38	0101001915	Food Physicochemical Analysis	3	3		Comp
39	0101001916	Food Physicochemical Analysis - Practice	1		1	Comp
40	0101001917	Worker Internship	2		2	Comp
41	0101001918	Environmental Analysis	3	3		Comp
42	0101000299	Catalytic engineering	3	3		Comp
43	0101001920	Scientific Research Methods	2	2		Comp
44	0101001924	Sensory Analysis	2	2		Comp
45	0101001934	Sensory Analysis – Practice	1		1	Comp
46	0101001925	Microbiological Analysis	2	2		Comp
47	0101001935	Microbiological Analysis – Practice	1		1	Comp

No	Course code	Course name	Number of credits	Theory	Practice	Category
48	0101001936	Product Design and Manufacturing Project – Chemical Engineering Technology	1	1		Comp
49	0101001937	Applied Informatics – Chemical Engineering Technology	3	2	1	Comp
50	0101001938	Biofuels and renewable energy	2	2		Ele
51	0101001939	Nanochemistry	2	2		Ele
52	0101001921	Cosmetic Fragrances	2	2		Ele
53	0101001922	Gas Processing Technology	2	2		Ele
54	0101001923	Cellulose and Paper Production Technology	2	2		Ele
55	0101001910	Technology of processing plastic products	2	2		Ele
Graduation Internship			**4**			
56	0101001926	Graduation Internship	4		4	**Comp**
Graduation Thesis/Replacement Subjects			**6**			
57	0101001927	Graduation Thesis	6		6	Ele
58	0101001928	Paint Production Techniques	2	2		Ele
59	0101001929	Dyeing Techniques	2	2		Ele
60	0101001930	Chromatography Techniques	2	2		Ele
61	0101001940	Organic pharmaceutical synthesis technology	2	2		Ele

7. TENTATIVE TEACHING PLAN

7.1. Semester 1

No.	Course Name	Credits	Total Hours	**Lecture**		**Type**
				Theory	**Practice**	
1	Basic English 1	3	45	45	–	COMP
2	Physical Education 1	1	30	–	30	PRE
3	General Chemistry	2	30	30	–	COMP
4	General Chemistry – Practice	1	30	–	30	COMP
5	Philosophy	3	45	45	–	COMP

No.	Course Name	Credits	Total Hours	Lecture		Type
				Theory	Practice	
6	General Law	2	30	30	–	COMP
7	Introduction to Chemical Engineering Technology	2	30	30	–	COMP
	Total Accumulated Credits	13				

7.2. Semester 2

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	National Defense & Security Education	8	165	75	90	PRE
2	Political Economy	2	30	30	–	COMP
3	Basic English 2	3	45	45	–	COMP
4	Physical Education 2	1	30	–	30	PRE
5	Probability Theory and Statistics	3	45	45	–	COMP
6	Inorganic Chemistry	2	30	30	–	COMP
7	Inorganic Chemistry – Practice	1	30	–	30	COMP
8	Basic Informatics	3	60	30	30	COMP
	Total Accumulated Credits	**14**				

7.3. Semester 3

NO	Course Name		Creadits	Total Hours	Lecture		Type
					Theory	Practice	
1	Organic Chemistry		2	30	30	–	COMP
2	Organic Chemistry – Practice		1	30	–	30	COMP
3	Scientific Socialism		2	30	30	–	COMP
4	General Biology		2	30	30	–	COMP
5	General Biology – Practice		1	30	–	30	COMP
6	Basic English 3		3	45	45	–	COMP
7	Physical Education 3		1	30	–	30	PRE
8	General Logic	Choose up to 2 credits	2	30	30		ELE
9	General Sociology		2	30	30		ELE
10	Environment and Human		2	30	30		ELE
	Total Accumulated Credits		**13**				

7.4. Semester 4

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Basic English 4	3	45	45	–	COMP
2	Ho Chi Minh’s Ideology	2	30	30	–	COMP

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
3	Advanced Mathematics 1	3	45	45	–	COMP
4	General Physics	2	30	30	–	COMP
5	General Physics – Practice	1	30	–	30	COMP
6	Organic Chemistry	2	30	30	–	COMP
7	Organic Chemistry – Practice	1	30	–	30	COMP
	Total Accumulated Credits	**14**				

7.5. Semester 5

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Basic English 5	3	45	45	–	COMP
2	History of the Communist Party of Vietnam	2	30	30	–	COMP
3	Analytical Chemistry 1	2	30	30	–	COMP
4	Analytical Chemistry 1 – Practice	1	30	–	30	COMP
5	Technical Drawing	2	30	30	–	COMP
6	Occupational Safety in Chemical Technology	2	30	30	–	COMP
7	Heat Transfer Processes and Equipment	2	30	30	–	COMP
	Total Accumulated Credits	**14**				

7.6. Semester 6

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Physical Chemistry 1	2	30	30	–	COMP
2	Physical Chemistry 1 – Practice	1	30	–	30	COMP
3	Analytical Chemistry 2	2	30	30	–	COMP
4	Analytical Chemistry 2 – Practice	1	30	–	30	COMP
5	Reaction Engineering and Equipment	3	45	45	–	COMP
6	English for Chemical Engineering Technology 1	3	45	45	–	COMP
	Total Accumulated Credits	**12**				

7.7. Semester 7

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Physical Chemistry 2	2	30	30		COMP

NO	Course Name		Creadits	Total Hours	Lecture		Type
					Theory	Practice	
2	Physical Chemistry 2 – Practice		1	30		30	COMP
3	English for Chemical Engineering Technology 2		3	45	45		COMP
4	Computational Methods	Choose up to 7 credits	3	45	45		ELE
5	Experimental Design		3	45	45		ELE
6	Materials Science		2	30	30		ELE
7	Measurement Engineering		2	30	30		ELE
8	Fundamentals of Chemical Plant Design		2	30	30		ELE
9	Polymer Physical Chemistry		2	30	30		ELE
10	Electrical Engineering and Electrical Safety		2	30	30		ELE
	Total Accumulated Credits		**13**				

7.8. Semester 8

NO	Course Name		Creadits	Total Hours	Lecture		Type
					Theory	Practice	
1	Mass Transfer Processes and Equipment		2	30	30		COMP
2	Detergent Production Technology		3	45	45		COMP
3	Detergent Production – Practice		1	30		30	COMP
4	Project: Process and Equipment		1	30		30	COMP
5	Biochemistry and Food Microbiology		2	30	30		COMP
6	Organic Synthesis Technology		3	45	45		COMP
7	Atomic Spectroscopy	Choose up to 2 credits	2	30	30		ELE
8	UV-Vis Spectroscopy		2	30	30		ELE
	Total Accumulated Credits		**14**				

7.9. Semester 9

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Innovation and Entrepreneurship	2	30	30		COMP
2	Orientation Internship	1	30		30	COMP
3	Petroleum Chemistry and Refining Technology	3	45	45		COMP
4	Pharmaceutical Chemistry	2	30	30		COMP
5	Pharmaceutical Chemistry – Practice	1	30		30	COMP
6	Food Physical-Chemical Analysis	3	45	45		COMP
7	Food Physical-Chemical Analysis – Practice	1	30		30	COMP
	Total Accumulated Credits	**13**				

7.10. Semester 10

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Professional Internship	2	60		60	COMP
2	Environmental Analysis	2	30	30		COMP
3	Catalysis Engineering	3	45	45		COMP
4	Sensory Analysis	2	30	30		COMP
5	Sensory Analysis – Practice	1	30		30	COMP
6	Microbiological Analysis	2	30	30		COMP
7	Microbiological Analysis – Practice	1	30		30	COMP
	Total Accumulated Credits	**13**				

7.11. Semester 11

NO	Course Name	Creadits	Total Hours	Lecture		Type
				Theory	Practice	
1	Research Methods and Scientific Report Writing	2	30	30		COMP
2	Project: Product Design and Manufacturing (Chemical Tech.)	1	30		30	COMP
3	Applied Informatics – Chemical Engineering	3	60	30	30	COMP
4	Biofuels and Choose	2	30	30		ELE

NO	Course Name		Creadits	Total Hours	Lecture		Type
					Theory	Practice	
	Renewable Energy	up to 4 credits					
5	Nanochemistry		2	30	30		ELE
6	Fragrance and Cosmetics		2	30	30		ELE
7	Gas Processing Technology		2	30	30		ELE
8	Cellulose and Paper Technology		2	30	30		ELE
9	Plastic Product Processing Technology		2	30	30		ELE
	Total Accumulated Credits		**10**				

7.12. Semester 12

NO	Course Name		Creadits	Total Hours	Lecture		Type
					Theory	Practice	
1	Graduation Internship (Chemical Engineering Tech)		4	120		120	COMP
2	Paint Manufacturing Technology	Choose Graduation Thesis or 3 alternative courses*	2	30	30		ELE
3	Dyeing Technology		2	30	30		ELE
4	Chromatographic Techniques		2	30	30		ELE
5	Organic Pharmaceutical Synthesis		2	30	30		ELE
6	Graduation Thesis (Chemical Engineering Tech)		6	180		180	ELE
	Total Accumulated Credits		**10**				

(*) Students who are not eligible to undertake the graduation thesis must take the 3 substitute courses.

Note: Comp = Compulsory, Ele = Elective, Pre = Prerequisite

8. PROGRAM IMPLEMENTATION GUIDELINES

8.1 For the Faculty and Departments:

The specialized faculty is responsible for reviewing and leading the development of detailed syllabi for all subjects in the foundational, major, and specialized knowledge blocks according to the required credit load of the program. It must provide a list of textbooks, lecture notes, and reference materials for all subjects to the university library and keep copies at the Faculty Office. At the beginning of each semester, the faculty should coordinate with relevant departments to implement the teaching plan on schedule.

Lecturers with at least a master's degree (in the relevant field or specialization) must be assigned to teach theoretical courses. Detailed course syllabi must be provided to ensure consistency with the university's overall teaching schedule.

Academic advisors must thoroughly understand the entire curriculum under the credit-based system to guide students in course registration.

8.2. For Lecturers:

When assigned to teach one or more courses, lecturers must study the course's detailed syllabus carefully to prepare appropriate lectures and teaching materials.

Lecturers must fully prepare lesson plans, textbook resources, and learning materials and distribute them to students for pre-class preparation.

Organize seminars, promote group study, and guide students in completing essays and projects. Lecturers are responsible for selecting suitable teaching methods, leading classroom presentations, facilitating discussions, solving practical problems in class, labs, or practice rooms, and guiding students in writing reports.

Focus on developing students’ self-study and research capabilities throughout the teaching process and during practical sessions.

Pay attention to the logical sequence of knowledge delivery and acquisition, ensure prerequisite courses are properly scheduled, and prepare teaching staff for Ele subjects as needed.

8.3. For Students:

Students must seek academic advisors' recommendations when selecting courses to align with the academic schedule. They are expected to study lessons before class to better understand lectures, attend all classes to receive instruction, and take responsibility for self-study and group participation, including attending all seminars.

Students are encouraged to actively utilize online and library resources for self-study, research, and completion of graduation projects. They must strictly follow examination, testing, and evaluation regulations.

Frequently participate in extracurricular, cultural, and sports activities to improve communication skills and broaden their understanding of society and people.

8.4. Facilities and Equipment for Teaching, Practice, and Internships:

Lecture rooms are equipped with traditional teaching tools and additional teaching aids (e.g., projectors).

Computer labs are equipped with software for basic informatics training.

Laboratories for basic physics, general chemistry, organic chemistry, and analytical chemistry are equipped for hands-on training.

Specialized laboratories for chemical engineering technology are fully equipped with appropriate machinery, devices, and tools.

RECTOR **FACULTY OF ENGINEERING TECHNOLOGY**