

MINISTRY OF EDUCATION AND TRAINING  
**QUY NHON UNIVERSITY**

**UNDERGRADUATE PROGRAM**

Level of Education : **Undergraduate**  
Major : **Chemistry Teacher Education**  
Major Code : **7140212**  
Mode of Education : **Full-time**

## UNDERGRADUATE PROGRAM

*(Issued in conjunction with Decision No.: 2178/QĐ-ĐHQN dated August 01, 2025  
by the Rector of Quy Nhon University)*

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### 1. PROGRAM OBJECTIVES (POs)

#### 1.1. General Objectives

The Bachelor's program in Chemistry Teacher Education aims to train graduates who possess sound political and ethical qualities, good health, and a solid foundation in both fundamental sciences and educational sciences. Graduates are expected to have the ability to apply specialized knowledge to address issues in education, chemistry teaching, and scientific research; demonstrate digital competence; and engage in lifelong learning while adapting to evolving educational environments. They also demonstrate professional responsibility and a commitment to community service, meeting the professional standards for teachers and contributing to socio-economic development, national defense and security, and international integration.

#### 1.2. Specific objectives

*Graduates of the Bachelor's program in Chemistry Teacher Education are expected to be able to:*

- **PO1:** Demonstrate professional knowledge and practical competencies required for teaching chemistry.

- **PO2:** Possess professional competencies in education, chemistry teaching, and scientific research to meet the requirements of general education reform and international integration.

- **PO3:** Demonstrate the capacity for lifelong learning, digital competence, communication, and collaboration in order to adapt to changes in the educational environment.

- **PO4:** Exhibit teachers' professional ethics, professional responsibility, a positive attitude, and a commitment to community service.

### 2. EMPLOYMENT OPPORTUNITIES AND FURTHER STUDY PROSPECTS

*Graduates of the Bachelor's program in Chemistry Teacher Education may assume the following positions:*

- Chemistry teachers at upper secondary schools, specialized schools, international schools, and vocational schools.
- Teaching assistants and lecturers at universities and colleges.
- Education specialists at Departments of Education and Training and curriculum development centers.
- Researchers at educational research institutes and institutes specializing in Chemistry and Chemistry education.
- Editors or authors of textbooks and reference materials for educational publishing houses.
- Staff members at educational centers and training organizations involved in teaching, Chemistry curriculum development, and STEM education.
- Consultants or trainers in companies related to chemicals, laboratory equipment, and education.

*Graduates may also pursue further studies at the Master's or Doctoral levels in Vietnam or abroad.*

### **3. LEARNING OUTCOMES**

The program is designed to ensure that graduates of the Chemistry Teacher Education program achieve the following learning outcomes:

<b>PLO1:</b> Apply knowledge of general education, foundational disciplinary knowledge, and field-specific knowledge to perform professional tasks.	<b>PI 1.1:</b> Identify general education knowledge, foundational disciplinary knowledge, and field-related knowledge required to perform professional tasks.
	<b>PI 1.2:</b> Apply knowledge of general education, foundational disciplinary knowledge, and field-related knowledge to perform professional tasks.
<b>PLO 2:</b> Apply fundamental knowledge of Chemistry to solve professional problems.	<b>PI 2.1:</b> Identify fundamental knowledge of Chemistry required to solve professional problems.
	<b>PI 2.2:</b> Apply fundamental knowledge of Chemistry to solve professional problems.
<b>PLO 3:</b> Analyze advanced knowledge of Chemistry in order to access new knowledge and solve practical problems.	<b>PI 3.1:</b> Analyze advanced knowledge of Chemistry to access new knowledge.
	<b>PI 3.2:</b> Analyze advanced knowledge of Chemistry to solve practical problems.

<b>PLO 4:</b> Conduct and propose improvement solutions for Chemistry experiments.	<b>PI 4.1:</b> Conduct Chemistry experiments.
	<b>PI 4.2:</b> Propose scientifically appropriate solutions related to improving practical and experimental procedures.
<b>PLO 5:</b> Organize and apply pedagogical communication skills in teaching and educational activities oriented toward the development of students' qualities and competencies.	<b>PI 5.1:</b> Organize teaching and educational activities oriented toward the development of students' qualities and competencies.
	<b>PI 5.2:</b> Apply pedagogical communication skills in teaching and educational activities oriented toward the development of students' qualities and competencies.
	<b>PI 5.3:</b> Evaluate teaching and educational activities oriented toward the development of students' qualities and competencies.
<b>PLO 6:</b> Conduct scientific research in professional practice.	<b>PI 6.1:</b> Develop a scientific research plan in professional practice.
	<b>PI 6.2:</b> Implement scientific research in professional practice.
<b>PLO 7:</b> Use specialized English, digital tools, and digital technologies in professional and pedagogical activities.	<b>PI 7.1:</b> Use specialized English in professional and pedagogical activities.
	<b>PI 7.2:</b> Use digital tools and digital technologies in professional and pedagogical activities.
<b>PLO 8:</b> Demonstrate autonomy in learning, self-directed study, and independent research, together with personal responsibility and the ability to collaborate effectively in learning and working environments.	<b>PI 8.1:</b> Demonstrate autonomy in learning, self-directed study, and independent research, together with a strong sense of personal responsibility in order to proactively acquire knowledge, develop independent thinking, and establish effective learning strategies.
	<b>PI 8.2:</b> Demonstrate the ability to collaborate in order to enhance learning quality, support students' holistic development, and contribute to building an educational environment that reflects the distinctive culture of the institution.
<b>PLO 9:</b> Demonstrate teachers' professional ethics and professional responsibility, and	<b>PI 9.1:</b> Identify ethical issues, professional responsibilities of teachers, and a commitment to community service.

engage in community service activities that contribute to the holistic development of individuals.	<b>PI 9.2:</b> Demonstrate teachers' professional ethics, professional responsibility, and engagement in community service activities in order to guide students' character development, build a positive learning environment, and contribute to the holistic development of individuals.
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#### 4. PROGRAM DURATION AND TOTAL CREDITS

4.1. Program Duration: 04 years

4.2. Total credits: 138 credits (excluding 03 credits of Physical Education and 09 credits of National Defense and Security Education)

Program structure	Credits
<b>General Knowledge</b>	<b>24</b>
<b>Professional Knowledge</b>	<b>114</b>
- Fundamental knowledge	24
- Disciplinary Knowledge	45
- Supplementary Knowledge	39
- Graduation thesis, Alternative courses	6
<b>Total</b>	<b>138</b>

#### 5. ADMISSION REQUIREMENTS

*Applicants wishing to apply for admission to the Chemistry Teacher Education program must satisfy the following requirements:*

a. Individuals who have been recognized as graduates of Vietnamese upper secondary education (high school) or who hold a foreign high school diploma recognized as equivalent.

b. Individuals who hold a vocational secondary diploma in a field within the same disciplinary group as the intended major and who have completed the required amount of general education knowledge at the upper secondary level in accordance with legal regulations.

c. Be in good health to undertake academic study in accordance with current regulations.

d. Meet the minimum admission threshold and other requirements for teacher education programs as stipulated in the *Regulations on University Admission and Admission to College Programs in Early Childhood Education* issued by the Ministry

of Education and Training, as well as the *University Admission Regulations* of Quy Nhon University.

## 6. MODE OF STUDY AND GRADUATION REQUIREMENTS

6.1. Mode of study: Credit-based system

6.2. Graduation Requirements: To be eligible for graduation, students must satisfy the following requirements:

- *Academic Requirements*: Students must complete all required courses and accumulate the total number of credits prescribed in the curriculum. In addition, they must obtain a minimum cumulative grade point average (CGPA) of 2.00 on a 4.0 scale.

- *Physical Education and National Defense and Security Education*: Students must complete all required Physical Education courses and obtain the National Defense and Security Education Certificate in accordance with current regulations.

- *Foreign Language Requirement*: Students must meet the foreign language proficiency requirement in accordance with the current regulations of the training institution.

- *Information Technology Requirement*: Students must meet the basic information technology competency standards as stipulated in Circular No. 07/2015/TT-BGDĐT, as well as other specific regulations of the training institution.

- *Conduct and Ethical Requirements*: At the time of graduation consideration, students must not be subject to criminal prosecution and must not be under disciplinary action at the level of suspension from study.

## 7. TEACHING METHODS AND LEARNING ASSESSMENT

7.1. Teaching methods

No	Teaching Strategies	Teaching methods
1	<p><b>Direct Instruction:</b> Direct instruction is a teaching process in which the instructor directly delivers information and fundamental knowledge to learners. In this approach, the teacher plays a central role in controlling, guiding, and organizing instructional activities. Through presentation, explanation, and detailed guidance, the teacher helps learners access, acquire, and clearly understand the lesson content. This teaching strategy is effective for providing systematic knowledge and introducing new skills, thereby establishing a solid foundation for learners to apply such knowledge</p>	<ul style="list-style-type: none"> <li>- Lecture/Presentation</li> <li>- Explanation and Illustration</li> <li>- Question–Answer Interaction</li> <li>- Problem-posing</li> <li>- Simulation</li> <li>- Demonstration</li> </ul>

No	Teaching Strategies	Teaching methods
	to professional practice and develop practical competencies.	
2	<p><b>Indirect Instruction:</b>            Indirect instruction is a teaching strategy in which learners are provided with opportunities to explore and construct knowledge through learning activities without relying entirely on the lecturer's direct transmission of information. In this strategy, the lecturer acts as a facilitator who organizes, guides, and supports the learning process rather than delivering all the instructional content directly. Learners are encouraged to actively engage in the learning process, apply critical thinking skills, and develop their ability to analyze and solve problems. Through various learning activities, this strategy helps learners enhance their capacity for self-directed learning and independent inquiry, while also fostering a stronger sense of responsibility and autonomy in their learning.</p>	<ul style="list-style-type: none"> <li>- Case-based learning</li> <li>- Problem-based learning</li> <li>- Guiding questions</li> <li>- Online teaching</li> <li>- Assignments</li> <li>- Discussion</li> <li>- Debate</li> <li>- Project-based learning</li> </ul>
3	<p><b>Experiential Learning:</b> Experiential learning consists of four stages: concrete experience, in which learners participate in practical activities such as group discussions, experimental practice, or field trips; reflective observation, during which learners reflect on and analyze the results, behaviors, and emotions arising from their experiences; abstract conceptualization, in which learners formulate concepts or theoretical insights based on their reflections; and active experimentation, where learners apply the acquired knowledge to new situations in order to test and refine their understanding. This approach not only facilitates the development of</p>	<ul style="list-style-type: none"> <li>- Experiential learning</li> <li>- Internship</li> <li>- Fieldwork</li> <li>- Simulation</li> <li>- Practice</li> <li>- Discussion</li> <li>- Project-based learning</li> </ul>

No	Teaching Strategies	Teaching methods
	knowledge and skills but also enhances learners' attitudes and engagement in the learning process.	
4	<p><b>Interactive Teaching:</b> Interactive teaching is a teaching strategy in which learners not only receive knowledge from the instructor but also interact with their peers, the instructor, and the learning content. In this approach, the instructor organizes and facilitates the learning process, while students actively participate in discussions, dialogue, and collaborative activities to construct knowledge. This process involves two-way interaction, continuous feedback, and adaptation, thereby fostering the development of communication, collaboration, critical thinking, and problem-solving skills, as well as enhancing learners' confidence and active engagement in learning.</p>	<ul style="list-style-type: none"> <li>- Interactive lectures</li> <li>- Group work</li> <li>- Discussions</li> <li>- Debates</li> <li>- Practice</li> <li>- Internships</li> <li>- Fieldwork</li> <li>- Project-based learning</li> </ul>
5	<p><b>Self-directed Learning:</b> Self-directed learning is a learning strategy in which learners guide and regulate their own learning process with little or no direct supervision from the instructor. Learners actively seek knowledge, plan their learning activities, and carry out learning tasks through assignments, projects, or problems suggested by the instructor. This strategy helps develop learners' capacity for independent learning and research, as well as their autonomy and sense of responsibility in the learning process.</p>	<ul style="list-style-type: none"> <li>- Online learning</li> <li>- Homework assignments</li> <li>- Self-directed learning</li> </ul>

## 7.2. Learning Assessment

The assessment of learning complies with the current undergraduate training regulations of Quy Nhon University.

*7.2.1. Assessment of Program Learning Outcomes: Conducted in accordance with the regulations on the assessment of Program Learning Outcomes of Quy Nhon University.*

## 7.2.2. Course Assessment and Grading

<b>Assessment and Grading of Courses</b>			
1. For theoretical courses or courses combining theory and practice	The overall course grade (hereinafter referred to as the course grade) consists of two components: the continuous assessment score and the final examination score.	Continuous assessment score: Accounts for 30%, 40%, or 50% of the total course grade.	The assessment methods, assessment formats, and the weighting of each component score are specified in the detailed course syllabus for each course.
		Final examination score: Accounts for 70%, 60%, or 50% of the total course grade.	
2. For courses consisting solely of laboratory or practical work	The arithmetic mean of the scores for all practical assignments during the semester, rounded to one decimal place, is taken as the grade for the practical course.		
3. For specialized courses such as internships, field practice, course projects, and course theses.	The faculty responsible for the course proposes the course assessment method, and the Rector makes the final decision.		
4. Assessment of the Graduation Project and Graduation Thesis	<ul style="list-style-type: none"> <li>- The assessment of the graduation project and graduation thesis is conducted by an evaluation committee established by decision of the Rector.</li> <li>- The committee consists of three members: a Chair, a reviewer, and a secretary (the supervisor is not a member of the committee). The committee organizes the defense and evaluates the graduation project or graduation thesis when all members are present.</li> </ul>	<ul style="list-style-type: none"> <li>- The grade for the graduation thesis or graduation project is calculated as the average of the component scores given by the supervisor and the members of the evaluation committee (<math>[\text{Supervisor's score} + \text{Scores from the three committee members}] / 4</math>).</li> <li>- Each component score is graded on a 10-point scale, recorded to one decimal place. The final grade for the graduation thesis or</li> </ul>	

<b>Assessment and Grading of Courses</b>		
		graduation project is also calculated on a 10-point scale, rounded to one decimal place, and then converted into a letter grade according to the prescribed grading scale.

### **Grading Scale used**

<b>Assessment Grading Scale</b>	The 10-point grading scale, ranging from 0 to 10 (with one decimal place), is used to assess and record the continuous assessment score, the final examination score, and the overall course grade.
	The letter grading scale is used to classify course results in an alternative form corresponding to the course grade on the 10-point grading scale.
	The 4-point grading scale is used to calculate the semester Grade Point Average (GPA) and the cumulative Grade Point Average (CGPA), and to evaluate students' academic performance after each semester or study period, as well as for graduation classification.

### **Conversion Rules Between Grading Scales**

<b>10-point Scale</b>	<b>Letter Grade</b>	<b>4-point Scale</b>	<b>Result</b>
9 - 10	A+	4	Pass
8 - 8,9	A	3,5	
7 - 7,9	B+	3	
6 - 6,9	B	2,5	
5 - 5,9	C	2	
4 - 4,9	D	1,5	
0 - 3,9	F	0	Fail

### *7.2.3. Assessment Methods*

<b>Assessment Methods</b>
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Observation Method	This method evaluates students' attendance and learning attitudes, including their learning awareness, independence, and creativity. It involves monitoring class attendance, students' preparation for lessons, participation in discussions, and contributions to classroom learning activities.
Assignment Assessment	This method evaluates the extent to which students complete the assignments given by the instructor related to the lesson during and after class. These assignments may be completed individually or in groups and are graded based on previously announced criteria.
Presentation Assessment	Students are required to work individually or in groups and present their results to other students. This activity not only evaluates the extent to which students have achieved specialized knowledge but also assesses the development of skills such as communication, negotiation, and teamwork.
Written Assessment Methods	Written assessment methods include essay-type tests and objective multiple-choice tests, or a combination of both.
Practical Assessment	Students are assessed based on criteria such as the correctness of procedures and operations performed, the outcomes obtained, and the quality of the practical report.
Oral Assessment	Students are assessed through interviews and direct question-and-answer interactions. This method is used in certain courses to evaluate students' overall competence, including both subject knowledge and skills such as communication and presentation.
Group Work Assessment	This method is used when implementing group-based learning activities to assess students' teamwork skills.
Essay / Term Paper Assessment	Students are assessed through writing a report on a topic related to a course or a practical issue, with the aim of drawing conclusions, providing comments, and proposing solutions for implementing or improving the identified issue. The assessment of the essay/term paper includes evaluation of its structure, content, conclusions, and presentation format.
Assessment of Learning Project Products	Based on the products developed by students, the instructor evaluates the level of development, creativity, and effectiveness of the completed product. The criteria and standards for



## 9. PROGRAM CONTENT

No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
<b>I. General Education Knowledge</b>				<b>24</b>									
<b>I.1. Political Science and Law</b>				<b>13</b>									
01	1130299	Philosophy of Marxism and Leninism	1	3	40		10			95		Political Theory, Law and Public Administration	
02	1130300	Political economics of marxism and leninism	2	2	27		6			62	1130299	Political Theory, Law and Public Administration	
03	1130049	Fundamentals of Law	1	2	27		6			62		Political Theory, Law and Public Administration	
04	1130301	Science socialism	3	2	27		6			62	1130300	Political Theory, Law and Public Administration	
05	1130302	History of Vietnamese Communist Party	4	2	27		6			62	1130301	Political Theory, Law and Public Administration	
06	1130091	Ho Chi Minh thought	5	2	27		6			62	1130302	Political Theory, Law and Public Administration	
<b>I.2. Physical Education and National Defense Security Education</b>				<b>12</b>									
<b>Physical Education: Choose 1 of the following 8 courses:</b>				<b>3</b>									
07	1120172	Physical Education 1 (Football 1)	1	1	4			26		21		Physical Education	
08	1120173	Physical Education 2 (Football 2)	2	1	4			26		21	1120172	Physical Education	
09	1120174	Physical Education 3 (Football 3)	3	1	4			26		21	1120173	Physical Education	

No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
10	1120175	Physical Education 1 (Volleyball 1)	1	1	4			26		21		Physical Education	
11	1120176	Physical Education 2 (Volleyball 2)	2	1	4			26		21	1120175	Physical Education	
12	1120177	Physical Education 3 (Volleyball 3)	3	1	4			26		21	1120176	Physical Education	
13	1120178	Physical Education 1 (Basketball 1)	1	1	4			26		21		Physical Education	
14	1120179	Physical Education 2 (Basketball 2)	2	1	4			26		21	1120178	Physical Education	
15	1120180	Physical Education 3 (Basketball 3)	3	1	4			26		21	1120179	Physical Education	
16	1120181	Physical Education 1 (Badminton 1)	1	1	4			26		21		Physical Education	
17	1120182	Physical Education 2 (Badminton 2)	2	1	4			26		21	1120181	Physical Education	
18	1120183	Physical Education 3 (Badminton 3)	3	1	4			26		21	1120182	Physical Education	
19	1120184	Physical Education 1 (Vietnamese Traditional Matial Arts 1)	1	1	4			26		21		Physical Education	
20	1120185	Physical Education 2 (Vietnamese Traditional Matial Arts 2)	2	1	4			26		21	1120184	Physical Education	
21	1120186	Physical Education 3 (Vietnamese Traditional Matial Arts 3)	3	1	4			26		21	1120185	Physical Education	
22	1120187	Physical Education 1 (Taekwondo Matial Arts 1)	1	1	4			26		21		Physical Education	
23	1120188	Physical Education 2 (Taekwondo Matial Arts 2)	2	1	4			26		21	1120187	Physical Education	
24	1120189	Physical Education 3 (Taekwondo Matial Arts 3)	3	1	4			26		21	1120188	Physical Education	
25	1120190	Physical Education 1 (Karatedo Matial Arts 1)	1	1	4			26		21		Physical Education	

No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
26	1120191	Physical Education 2 (Karatedo Matial Arts 2)	2	1	4			26		21	1120190	Physical Education	
27	1120192	Physical Education 3 (Karatedo Matial Arts 3)	3	1	4			26		21	1120191	Physical Education	
28	1120239	Physical Education 1 (Pickleball 1)	1	1	4			26		21		Physical Education	
29	1120240	Physical Education 2 (Pickleball 2)	2	1	4			26		21	1120239	Physical Education	
30	1120241	Physical Education 3 (Pickleball 3)	3	1	4			26		21	1120240	Physical Education	
<b>National Defense and Security Education</b>				<b>9</b>									
31	1120168	National Defense and Security Education 1	5	3	37		8			82		National Defense and Security Education	
32	1120169	National Defense and Security Education 2	5	2	22		8			52		National Defense and Security Education	
33	1120170	National Defense and Security Education 3	5	2	14			16		44		National Defense and Security Education	
34	1120171	National Defense and Security Education 4	5	2	4			56		36		National Defense and Security Education	
<b>I.3. Foreign Languages</b>				<b>7</b>									
35	1090061	English 1	1	3	30	15				100		Foreign Languages	
36	1090166	English 2	2	4	40	20				135	1090061	Foreign Languages	
<b>I.4. Social Sciences/Mathematics; Natural Sciences–Environment; Management Sciences</b>				<b>4</b>									
37	2010156	Pedagogical Communication	4	2	20			20		55		Education	
38	2010171	Experiential and Career-Oriented Activities in Schools	5	2	20			20		55		Education	
<b>II. Professional Education Knowledge</b>				<b>114</b>									
<b>II.1. Fundamental knowledge and Disciplinary Knowledge</b>				<b>24</b>									
39	1050242	ICT Fundamentals for Education	1	3	30			30		85		Information Technology	

No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
40	1100086	Psychology	2	3	30	10	10			95	1130299	Social Sciences and Humanities	
41	2030410	Pedagogics	3	4	36	20	0	8		131	1100086	Social Sciences and Humanities	
42	2020624	General Physics	1	2	20	10				65		Natural Sciences	
43	2010166	Advanced Mathematics	1	2	20	10				65		Education	
44	1010480	Probability and Statistics	2	2	22	8				65	1010386	Department of Mathematics And Statistics	
45	1030240	Laboratory Techniques and Safety	2	1	14		2			29		Natural Sciences	
46	1030058	General Chemistry 1	1	3	24	15	12			94		Natural Sciences	
47	1030059	General Chemistry 2	2	3	25	15	10			95	1030058	Natural Sciences	
48	1030239	General Chemistry Practice	3	1				30		15	1030059	Natural Sciences	
<b>II.2. Major and Specialization Knowledge (if any)</b>													
<b>II.2.1. Major Knowledge</b>				<b>45</b>									
<b>II.2.1a. Compulsory Courses</b>				<b>41</b>									
49	2020723	Technical Chemistry	5	3	28	02	10	20		85	1030067	Natural Sciences	
50	1030069	Environmental chemistry	7	2	24	4	4			63	1030067	Natural Sciences	
51	1030066	Organic chemistry (part 1)	3	3	37	8				100	1030059	Natural Sciences	
52	1030067	Organic chemistry (part 2)	4	3	37	8				100	1030066	Natural Sciences	



No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
67	1030247	Selected Physical Chemistry Contents in High School Education	7	2	20	8	4			63	1030016	Natural Sciences	
68	1030244	Some selective problems in Organic Chemistry	7	2	17	13				65	1030018	Natural Sciences	
69	2020725	Radiochemistry and Rare Earth Elements	7	2	20	10					2020722	Natural Sciences	
<i>Choose 1 of the following 3 courses:</i>				2									
70	1030248	Nanomaterials and Green Chemistry	7	2	25		10			60	2020004	Natural Sciences	
71	2020726	Chemistry For Life	7	2	24		12			59		Natural Sciences	
72	1030184	Inorganic materials	7	2	25		10			60	2020722	Natural Sciences	
<b>II.3. Supplementary Knowledge</b>				<b>39</b>									
<b>II.3.1. Professional Training and Skill Development</b>				<b>32</b>									
<b>III.3.1a. Compulsory Courses</b>				<b>30</b>									
73	1030261	Organic Chemistry Practice	5	2				60		30	1030067	Natural Sciences	
74	1030264	Qualitative Analysis Chemistry Practice	4	1				30		15	2020376	Natural Sciences	
75	1030157	Quantitative Analysis Chemistry Practice	5	1				30		15	1030242	Natural Sciences	
76	2020449	Practice on physicochemical methods of analysis	6	1				30		15	1030157	Natural Sciences	
77	1030262	Experimental Inorganic Chemistry	4	2				60		30	2020722	Natural Sciences	
78	1030263	Chemical Thermodynamics and Kinetics Practice	5	1				30		15	1030036	Natural Sciences	

No	Course codes	Course Name	Semester	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
					Theory	Exercise	Discussion						
79	1030266	Electrochemistry and Collochemistry Practice	6	1				30		15	1030029	Natural Sciences	
80	2010045	Chemical teaching methods 1	5	2	20	5	10			55	1100026	Education	
81	1030250	Chemical teaching methods 2	6	3	35	5	10			85	2010045	Education	
82	1030251	Practice of chemistry teaching methods	6	2				60		30	2010045	Education	
83	2010052	Researching pedagogical scientific applied in teaching chemistry	8	2	10			40		40	1030250	Education	
84	1030253	Using visual tools for teaching	6	2				60		30	2010045	Education	
85	1030258	Active teaching methods	7	2	21	9				60	1030251 1030253	Education	
86	2010048	Assessment and Evaluation in Chemistry teaching	7	2	16	9	10			55	1030250	Education	
87	2010047	Training of teaching method 1	6	2				60		30	2010045	Education	
88	2010049	Training of teaching method 2	7	2				60		30	2010047	Education	
89	1030309	English for Chemistry	3	2	24	4	4			63	1090166	Natural Sciences	
<i>III.3.1b. Elective Courses</i>				2									
<i>Choose 1 of the following 4 courses:</i>				2									
90	2010212	Organizing STEM-themed teaching in general education schools	7	2	25	0	10	0				Education	
91	1150422	Start-up	7	2	21		10			60		Finance and Banking &	



## 9. TENTATIVE TEACHING PLAN

### Semester 1

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1130049	Fundamentals of Law	2	27		6			62		Political Theory, Law and Public Administration	
2	1130299	Philosophy of Marxism and Leninism	3	40		10			85		Political Theory, Law and Public Administration	
3	1090061	English 1	3	37	8				100		Foreign Languages	
4	1050242	ICT Fundamentals for Education	3	30			30		85		Information Technology	
5	1030058	General Chemistry 1	3	24	15	12			94		Natural Sciences	
6	2020624	General Physics	2	20	10				65		Natural Sciences	
7	2010166	Advanced Mathematics	2	20	10				65		Education	
<b>Choose 1 of the following 8 courses:</b>			<b>1</b>									
8	1120172	Physical Education 1 (Football 1)	1	4			26		21		Physical Education	
9	1120175	Physical Education 1 (Volleyball 1)	1	4			26		21		Physical Education	
10	1120178	Physical Education 1 (Basketball 1)	1	4			26		21		Physical Education	
11	1120181	Physical Education 1 (Badminton 1)	1	4			26		21		Physical Education	
12	1120184	Physical Education 1 (Vietnamese)	1	4			26		21		Physical Education	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
		Traditional Matial Arts 1)										
13	1120187	Physical Education 1 (Taekwondo Matial Arts 1)	1	4			26		21		Physical Education	
14	1120190	Physical Education 1 (Karatedo Matial Arts 1)	1	4			26		21		Physical Education	
15	1120239	Physical Education 1 (Pickleball 1)	1	4			26		21		Physical Education	
<b>Total (excluding Physical Education courses):</b>			<b>18</b>									

### Semester 2:

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1130300	Political economics of marxism and leninism	2	27		6			62	1130299	Political Theory, Law and Public Administration	
2	1010480	Probability and Statistics	2	22	8				65	1010386	Department of Mathematics And Statistics	
3	1090166	English 2	4	40	20				135	1090061	Foreign Languages	



**Semester 3:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1130301	Science socialism	2	27		6			62	1130300	Political Theory, Law and Public Administration	
2	2030410	Pedagogics	4	36	20	0	8		131	1100086	Social Sciences and Humanities	
3	2020721	Inorganic Chemistry 1	2	30	15				90	1030059	Natural Sciences	
4	1030066	Organic chemistry (part 1)	3	37	8				100	1030059	Natural Sciences	
5	2020376	Chemistry of Qualitative Analysis	2	22	6	4			63	1030059	Natural Sciences	
6	1030109	Chemical Thermodynamics	2	20	8	4			63	1030059	Natural Sciences	
7	1030239	General Chemistry Practice	1				30		15	1030059	Natural Sciences	
8	1030309	English for Chemistry	2	24	4	4			63	1090166	Natural Sciences	
9	2020724	Structural Inorganic Chemistry	2	20	10				65	1030059	Natural Sciences	
<b>Choose 1 of the following 8 courses:</b>			<b>1</b>									
10	1120174	Physical Education 3 (Football 3)	1	4			26		21	1120173	Physical Education	
11	1120177	Physical Education 3 (Volleyball 3)	1	4			26		21	1120176	Physical Education	
12	1120180	Physical Education 3 (Basketball 3)	1	4			26		21	1120179	Physical Education	
13	1120183	Physical Education 3 (Badminton 3)	1	4			26		21	1120182	Physical Education	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
14	1120186	Physical Education 3 (Vietnamese Traditional Matial Arts 3)	1	4			26		21	1120185	Physical Education	
15	1120189	Physical Education 3 (Taekwondo Matial Arts 3)	1	4			26		21	1120188	Physical Education	
16	1120192	Physical Education 3 (Karatedo Matial Arts 3)	1	4			26		21	1120191	Physical Education	
17	1120241	Physical Education 3 (Pickleball 3)	1	4			26		21	1120240	Physical Education	
<b>Total (excluding Physical Education courses):</b>			<b>19</b>									

**Semester 4:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1130302	History of Vietnamese Communist Party	2	27		6			62	1130301	Political Theory, Law and Public Administration	
2	2010156	Pedagogical Communication	2	20			20		55	2030410	Education	
3	1030067	Organic chemistry (part 2)	3	37	8				100	1030066	Natural Sciences	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
4	1030242	Quantitative analysis chemistry	2	22	6	4			63	2020376	Natural Sciences	
5	2020722	Inorganic Chemistry 2	3	37	8	0			100	2020721	Natural Sciences	
6	1030036	Chemical Kinetics	2	23	5	4			63	1030109	Natural Sciences	
7	1030264	Qualitative Analysis Chemistry Practice	1				30		15	2020376	Natural Sciences	
8	1030262	Experimental Inorganic Chemistry	2				60		30	2020722	Natural Sciences	
<b>Total</b>			<b>19</b>									

**Semester 5:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1130091	Ho Chi Minh thought	2	27		6			62	1130302	Political Theory, Law and Public Administration	
2	2010171	Experiential and Career-Oriented Activities in Schools	2	20			20		55	2030410	Education	
3	2020723	Technical Chemistry	3	28	02	10	20		85	1030067	Natural Sciences	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
4	1030263	Chemical Thermodynamics and Kinetics Practice	1				30		15	1030036	Natural Sciences	
5	2020727	Electrochemistry and Colloid	2	22	8				65	1030036	Natural Sciences	
6	1030261	Experimental Inorganic Chemistry	2				60		30	1030067	Natural Sciences	
7	1030157	Quantitative Analysis Chemistry Practice	1				30		15	1030242	Natural Sciences	
8	1030018	Theoretical basis of organic chemistry	3	34	10	2			99	1030067	Natural Sciences	
9	2010045	Chemical teaching methods 1	2	20	5	10			55	1100026	Education	
<b>National Defense and Security Education</b>			<b>9</b>									
10	1120168	National Defense and Security Education 1	3	37		8			82		National Defense and Security Education	
11	1120169	National Defense and Security Education 2	2	22		8			52		National Defense and Security Education	
12	1120170	National Defense and Security Education 3	2	14			16		44		National Defense and Security Education	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
13	1120171	National Defense and Security Education 4	2	4			56		36		National Defense and Security Education	
<b>Total</b> (excluding National Defense-Security Education courses):			<b>18</b>									

**Semester 6:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1030016	Fundamentals of Quantum Chemistry	2	20	4	12		59	1030067 2020722	Natural Sciences		
2	2020449	Practice on physicochemical methods of analysis	1				30	15	1030157	Natural Sciences		
3	1030266	Electrochemistry and Collochemistry Practice	1				30	15	1030029	Natural Sciences		
4	1030250	Chemical teaching methods 2	3	35	5	10		85	2010045	Education		
5	1030251	Practice of chemistry teaching methods	2				60	30	2010045	Education		
6	2010052	Researching pedagogical scientific	2	10			40	40	1030250	Education		

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
		applied in teaching chemistry										
7	1030253	Using visual tools for teaching	2				60	30	2010045	Education		
8	2010047	Training of teaching method 1	2				60	30	2010045	Education		
9	2020004	Modern Analytical Methods	2	24	4	4		58	1030242	Natural Sciences		
10	1030170	Practical Chemical Manufacturing	1						1030078	Education		
<b>Total</b> (excluding National Defense-Security Education courses):			<b>18</b>									

**Semester 7:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1030069	Environmental chemistry	2	24	4	4		63	1030067	Natural Sciences		
2	1030072	Computational Chemistry	2	12		6	30	47	1030016	Natural Sciences		
3	1030258	Active teaching methods	2	21	9			60	1030251 1030253	Education		

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
4	2010049	Training of teaching method 2	2				60		30	2010047	Education	
5	1030166	Teaching Practicum 1	1					TT		1030251	Education	
6	2010048	Assessment and Evaluation in Chemistry teaching	2	16	9	10			55	1030250	Education	
7	2020003	Spectroscopic methods in chemistry	2	14	12	8			56	2020004	Natural Sciences	
<i>Choose 1 of the following 4 courses:</i>			2									
8	2010212	Organizing STEM-themed teaching in general education schools	2	2	25	0	10	0			Education	
9	1150422	Start-up	2	21	4	10		60			Finance and Banking & Business Administration	
10	1030257	Environmental education in chemistry teaching at high school	2	21	4	10			55	1030250	Education	
11	2010050	The experience activities in teaching chemistry	2	21	4	10			55	1030250 1030258	Education	
<i>Choose 1 of the following 3 courses:</i>			2									
12	1030247	Selected Physical Chemistry Contents in High School Education	2	20	8	4			63	1030016	Natural Sciences	

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
13	1030244	Some selective problems in Organic Chemistry	2	17	13			65	1030018	Natural Sciences		
14	2020725	Radiochemistry and Rare Earth Elements	2	20	10			65	2020722	Natural Sciences		
<i>Choose 1 of the following 3 courses:</i>												
15	1030248	Nanomaterials and Green Chemistry	2	25		10		60	2020004	Natural Sciences		
16	2020726	Chemistry For Life	2	24		12		59		Natural Sciences		
17	1030184	Inorganic materials	2	25		10		60	2020722	Natural Sciences		
<b>Total</b>			<b>19</b>									

**Semester 8:**

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
1	1030167	Teaching Practicum 2	5					Practicum	1030166	Education		
<i>Graduation thesis</i>												

No	Course code	Course name	Number of credits	In-class hours			Experiment, Practice	Others	Self-study hours	Prerequisite Course Code	Department in charge of the course	Note
				Theory	Exercise	Discussion						
2	2010051	Graduation thesis	6					Thesis			Education	
<i>Alternative Courses</i>												
3	2010046	Chemical exercises in high school	2	21	4	10			55	2010045	Education	
4	2020450	Organic Chemistry Exercises	2	10	20				65	1030018	Natural Sciences	
5	1030260	Exercises in Inorganic Chemistry	2	6	24				65	2020722	Natural Sciences	
<b>Total</b>			<b>11</b>									

## 10. GUIDELINES FOR THE IMPLEMENTATION OF THE PROGRAM

This training program is applied from the 2025 admission cohort for students majoring in Chemistry Teacher Education.

The training process is implemented based on a curriculum that has been designed in accordance with the training objectives, learner characteristics, workforce requirements, and the specific demands of the discipline. For elective courses, depending on actual conditions, development trends, and social needs, the Faculty will provide guidance to help students select appropriate courses.

The Head of the Faculty is responsible for organizing and guiding the principles for developing detailed course syllabi to ensure that the objectives, content, and requirements are met, while also responding to the needs of learners and society.

The training program is regularly reviewed, evaluated, and updated. The results of these reviews and evaluations are used to improve and enhance the quality of training. The comprehensive review cycle of the training program is conducted at least once every five years.

*Gia Lai, August 01, 2025*

**RECTOR**

**Assoc. Prof. Dr. Doan Duc Tung**