

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

**UNDERGRADUATE PROGRAM**

Level of education : **Undergraduate**  
Major : **Chemistry**  
Speciality (if any) : **1. Pharmaceutical Chemistry**  
**2. Cosmetic Chemistry**  
Code : **7440112**  
Type of education : **Full-time**

*Binh Dinh, 2024*

## UNDERGRADUATE PROGRAM

(Issued together with Decision No. 2010/QĐ-ĐHQN on June 20<sup>th</sup>, 2024, by the Rector of Quy Nhon University)

Level of education	:	<b>Undergraduate</b>
Major	:	<b>Chemistry</b>
Speciality (if any)	:	<b>1. Pharmaceutical Chemistry 2. Cosmetic Chemistry</b>
Code	:	<b>7440112</b>
Type of education	:	<b>Full-time</b>

### 1. PROGRAM OBJECTIVES (POs)

#### 1.1. General objectives

The Bachelor of Chemistry program provides students with comprehensive theoretical knowledge, practical competencies, scientific research skills, and capabilities in application development within science, technology, and innovation. The program places a particular emphasis on pharmaceutical and cosmetic chemistry. It aims to prepare graduates who demonstrate strong political and ethical qualities, a high sense of responsibility, and a commitment to serving the community, while meeting the requirements of socio-economic development, national defense and security, and international integration.

#### 1.2. Specific objectives

+ *Knowledge*

**PO1:** Demonstrates foundational knowledge in natural sciences, life sciences, social sciences, political science, law, and national defense and security, enabling the application of such knowledge to professional activities and lifelong learning.

**PO2:** Possesses comprehensive and in-depth theoretical knowledge in inorganic chemistry, organic chemistry, physical chemistry, and analytical chemistry; demonstrates fundamental knowledge in pharmaceutical and cosmetic chemistry; maintains solid competencies in chemical experiments and laboratory practices; and has knowledge related to research, development, production, and quality control of pharmaceutical and cosmetic raw materials.

+ *Skills*

**PO3:** Exhibits proficient skills in operating laboratory equipment; demonstrates competence in data processing and result evaluation; and is capable of proactively solving chemistry-related and pharmaceutical/cosmetic chemistry-related problems independently or within interdisciplinary and multidisciplinary teams.

**PO4:** Demonstrates critical thinking, effective communication skills, and the ability to disseminate knowledge related to chemistry, pharmaceutical chemistry, and cosmetic chemistry.

+ *Autonomy and Responsibility*

**PO5:** Shows the capacity for self-directed learning, innovation, entrepreneurial thinking, and digital competency.

**PO6:** Upholds professional ethics, demonstrates responsibility, and maintains a strong sense of community service.

## **2. EMPLOYMENT OPPORTUNITIES AND FURTHER STUDY PROSPECTS**

Graduates of the Chemistry program, with a specialization in Pharmaceutical Chemistry/Cosmetic Chemistry, can:

+ Conduct research and development activities related to chemistry, with a particular emphasis on pharmaceutical and cosmetic products.

+ Perform analysis, testing, and quality management of chemistry-related products, especially those in the pharmaceutical and cosmetic sectors.

+ Participate in production processes involving chemical products, particularly pharmaceuticals and cosmetics.

+ Engage in the business and distribution of laboratory equipment, chemicals, and pharmaceutical/cosmetic products.

+ Teach at universities and colleges and teach at high schools upon completing the pedagogical training program in accordance with Circular No. 12/2021/TT-BGDĐT dated April 5th, 2021, issued by the Ministry of Education and Training.

+ Pursue further studies at higher levels at Quy Nhon University or other educational institutions in Vietnam and abroad.

## **3. LEARNING OUTCOMES**

The program is structured to ensure that graduates achieve the following learning outcomes:

### **3.1. Knowledge**

**PLO1:** Apply foundational knowledge in natural sciences, life sciences, social sciences, political science, security and defense, and law to daily life and professional practice.

**PLO2:** Apply information technology skills and foreign language competencies to support professional tasks.

**PLO3:** Analyze theoretical and practical knowledge in inorganic chemistry, organic chemistry, physical chemistry, analytical chemistry, and related interdisciplinary fields.

**PLO4:** Apply knowledge of pharmaceutical and cosmetic chemistry to select and implement appropriate solutions in raw material production, research, and product development in the pharmaceutical/cosmetic fields.

**PLO5:** Apply fundamental knowledge of business administration, project management, and entrepreneurship to organize and implement professional activities.

### 3.2. Skills

**PLO6:** Use English to search for scientific information and to read, understand, and produce basic texts in chemistry and pharmaceutical/cosmetic chemistry; achieve foreign language proficiency level 3/6 of the Vietnamese Six-Level Foreign Language Proficiency Framework or an equivalent standard.

**PLO7:** Demonstrate proficiency in operating basic and selected modern laboratory instruments; use chemistry-related software, simulation tools, and statistical software to describe and analyze data, interpret experimental results, and evaluate outcomes; and meet the IT competency requirements as stipulated by Quy Nhon University.

**PLO8:** Apply design thinking, entrepreneurial thinking, digital skills, and teamwork competencies to propose ideas and innovative solutions, either independently or as part of interdisciplinary and multidisciplinary teams.

**PLO9:** Apply communication skills to convey and disseminate knowledge related to chemistry and pharmaceutical/cosmetic chemistry in professional contexts and lifelong learning.

### 3.3. Autonomy and Responsibility

**PLO10:** Demonstrate professional ethics and the ability to acquire and apply new knowledge in learning, research, and professional activities.

**PLO11:** Coordinate and effectively manage professional activities aligned with the sustainable development goals of the local community, the nation, and the region.

## 4. PROGRAM DURATION AND TOTAL CREDITS

**4.1. Program Duration:** 04 years

**4.2. Total credits:** 135 credits (Excluding: Physical Education and National Defense and Security Education courses)

Program structure	Credits
<b>General Knowledge</b>	24
<b>Professional Knowledge</b>	111
- Fundamental knowledge	29
- Specialized knowledge (if any)	45
- Supplementary Knowledge	31
- Graduation thesis, Alternative courses	6
<b>Total</b>	135

## 5. ADMISSION REQUIREMENTS

Admission criteria comply with the current enrollment regulations of Quy Nhon University.

## 6. TRAINING METHOD, GRADUATION REQUIREMENTS

**6.1. Training Method:** In accordance with the current undergraduate training regulations of Quy Nhon University.

**6.2. Graduation Requirements:**

+ Accumulate the required coursework and a minimum of 135 credits as specified in the training program.

+ Achieve a cumulative GPA of at least 2.0 for the entire academic program.

+ Meet the foreign language and information technology competency standards as prescribed by Quy Nhon University.

+ Complete all Physical Education requirements and obtain the certificate in National Defense and Security Education.

## 7. TEACHING AND LEARNING ASSESSMENT METHODS

+ Assessment methods include written examinations, oral examinations, reports, and essays.

+ Assessment results are expressed using the 10-point scale, the letter-grade scale, and the 4-point scale.

## 8. PROGRAM CONTENT

No	Course Code	Course Name	Semester	Number of credits	Class Time Schedule			Experimental /Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty	Note
					Theory	Practise	Tests						
<b>I. General Knowledge</b>				<b>24</b>	(Excluding: 3 credits for Physical Education and 9 credits for National Defense and Security Education)								
<b>I.1. Political Science and Law</b>				<b>13</b>									
1	1130299	Philosophy of marxism and leninism	1	3	40	0	10	0	4	96		FPTLSM	
2	1130300	Political economics of marxism and leninism	2	2	27	0	6	0	3	64	1130299	FPTLSM	
3	1130301	Scientific socialism	3	2	27	0	6	0	3	64	1130300	FPTLSM	
4	1130302	History of the Vietnamese Communist Party	4	2	27	0	6	0	3	64	1130301	FPTLSM	
5	1130091	Ho Chi Minh thought	5	2	27	0	6	0	3	64	1130302	FPTLSM	
6	1130049	General law	2	2	27	0	6	0	3	64	1130299	FPTLSM	
<b>I.2. Physical Education, National Defense, and Security Education</b>				<b>ĐK</b>									
<b>I.2.1. National Defense and Security Education</b>				<b>9</b>									
7	1120168	<i>National Defense and Security Policy of the Communist Party of VietNam (*)</i>	4	3	37	0	8	0	4	101		CNDSE	
8	1120169	<i>National Defense and Security Works (*)</i>	4	2	22	0	8	0	3	67	1120168	CNDSE	
9	1120170	<i>General Military (*)</i>	4	2	14	0	0	16	3	67	1120169	CNDSE	
10	1120171	<i>Infrantry Combat Techniques and Tactics (*)</i>	4	2	4	0	0	56	3	37	1120170	CNDSE	
<b>I.2.2. Physical Education (select 1 in 7 groups)</b>				<b>3</b>									
11	1120172	<i>Physical Education 1 (Football 1) (*)</i>	1	1	4	0	0	26	3	17		FPE	
12	1120173	<i>Physical Education 2 (Football 2) (*)</i>	2	1	4	0	0	26	3	17	1120172	FPE	
13	1120174	<i>Physical Education 3 (Football 3) (*)</i>	3	1	4	0	0	26	3	17	1120173	FPE	
14	1120175	<i>Physical Education 1 (Volleyball 1) (*)</i>	1	1	4	0	0	26	3	17		FPE	
15	1120176	<i>Physical Education 2 (Volleyball 2) (*)</i>	2	1	4	0	0	26	3	17	1120175	FPE	
16	1120177	<i>Physical Education 3 (Volleyball 3) (*)</i>	3	1	4	0	0	26	3	17	1120176	FPE	

17	1120178	Physical Education 1 (Basketball 1) (*)	1	1	4	0	0	26	3	17		FPE	
18	1120179	Physical Education 2 (Basketball 2) (*)	2	1	4	0	0	26	3	17	1120178	FPE	
19	1120180	Physical Education 3 (Basketball 3) (*)	3	1	4	0	0	26	3	17	1120179	FPE	
20	1120181	Physical Education 1 (Badminton 1) (*)	1	1	4	0	0	26	3	17		FPE	
21	1120182	Physical Education 2 (Badminton 2) (*)	2	1	4	0	0	26	3	17	1120181	FPE	
22	1120183	Physical Education 3 (Badminton 3) (*)	3	1	4	0	0	26	3	17	1120182	FPE	
23	1120184	Physical Education 1 (Vietnamese Traditional Martial Arts 1) (*)	1	1	4	0	0	26	3	17		FPE	
24	1120185	Physical Education 2 (Vietnamese Traditional Martial Arts 2) (*)	2	1	4	0	0	26	3	17	1120184	FPE	
25	1120186	Physical Education 3 (Vietnamese Traditional Martial Arts 3) (*)	3	1	4	0	0	26	3	17	1120185	FPE	
26	1120187	Physical Education 1 (Taekwondo Martial Arts 1) (*)	1	1	4	0	0	26	3	17		FPE	
27	1120188	Physical Education 2 (Taekwondo Martial Arts 2) (*)	2	1	4	0	0	26	3	17	1120187	FPE	
28	1120189	Physical Education 3 (Taekwondo Martial Arts 3) (*)	3	1	4	0	0	26	3	17	1120188	FPE	
29	1120190	Physical Education 1 (Karatedo Martial Arts 1) (*)	1	1	4	0	0	26	3	17		FPE	
30	1120191	Physical Education 2 (Karatedo Martial Arts 2) (*)	2	1	4	0	0	26	3	17	1120190	FPE	
31	1120192	Physical Education 3 (Karatedo Martial Arts 3) (*)	3	1	4	0	0	26	3	17	1120191	FPE	
<b>I.3. Foreign Language</b>				<b>7</b>									
32	1090061	English 1	1	3	30	15	0	0	4	101		FFL	
33	1090166	English 2	2	4	40	20	0	0	4	136	1090061	FFL	
<b>I.4. Social Science/Math, Natural Science - Environment, Management Science</b>				<b>4</b>									
34	1150422	Start up	5	2	25	0	10	0	3	67	1130300	FFBA	
35	2030003	Communication Skills	2	2	18	0	4	20	3	55		FSSH	
<b>II. Professional Knowledge</b>				<b>111</b>									
<b>II.1. Fundamental Knowledge</b>				<b>29</b>									
36	2020562	An introduction to chemistry	1	1	12	0	6	0	3	29		FNS	
37	1010474	Advanced Mathematics, Probability and Statistics	1	3	30	15	0	0	4	101		FMS	
38	2020561	General Physics	1	2	20	8	4	0	3	65		FNS	
39	1050390	Basic informatics	1	3	24	6	0	30	4	86		FIT	
40	2020566	General Biology	4	2	30	0	0	0	3	67		FNS	
41	2020570	English for Chemistry Students	5	2	24	4	4	0	3	65	1090166	FNS	
42	2020196	General Chemistry 1	1	2	20	10	0	0	3	67		FNS	
43	2020564	General Chemistry 2	2	2	20	10	0	0	3	67	2020196	FNS	
44	2020198	Inorganic Chemistry 1	2	2	23	7	0	0	3	67	2020196	FNS	
45	2020568	Inorganic Chemistry 2	3	3	30	12	6	0	4	98	2020198	FNS	
46	2020565	Organic chemistry (part 1)	2	2	25	5	0	0	3	67	2020196	FNS	
47	2020569	Organic chemistry (part 2)	3	3	34	11	0	0	4	101	2020565	FNS	
48	1030243	The chemistry of natural products	4	2	12	12	12	0	3	61	2020569	FNS	
<b>II.2. Specialized knowledge</b>				<b>45</b>									
<b>II.2.1. Specialized knowledge: General</b>				<b>27</b>									
<b>II.2.1a. Compulsory</b>				<b>21</b>									
49	2020200	Physical Chemistry 1	3	2	22	8	0	0	3	67	1010474 2020561 2020564	FNS	

50	2020572	Physical Chemistry 2	4	3	33	8	8	0	4	97	2020200	FNS	
51	2020580	Organic synthesis in medicinal chemistry and cosmetics	6	2	18	12	0	0	3	67	1030243	FNS	
52	2020581	Application Of Spectroscopy Methods In Pharmaceutical And Cosmetic Analysis	6	2	16	14	0	0	3	67	2020568 2020569	FNS	
53	2020201	Chemistry of qualitative analysis	3	2	22	4	8	0	3	63	2020568 2020569	FNS	
54	1030274	Quantitative analysis of chemistry	4	2	22	6	4	0	3	65	2020201	FNS	
55	1030125	Process and equipment of chemical technology	5	2	26	0	8	0	3	63	2020200	FNS	
56	1030089	Biochemistry	5	2	26	0	8	0	3	63	2020566 2020569	FNS	
57	2020217	Green Chemistry	5	2	25	0	10	0	3	62	2020568 2020569	FNS	
58	2020575	Methods of physical and chemical analysis	5	2	24	2	8	0	3	63	1030274	FNS	
<b>II.2.1b. Optional</b>				<b>6</b>									
59	2020212	Technical Chemistry	6	2	22	4	8	0	3	63	2020568 2020569 2020572	FNS	
60	1150563	Supply chain management and produce traceability	6	2	25	5	0	0	3	67		FFBA	
61	2020577	Microbiology	6	2	26	0	8	0	3	63	2020566	FNS	
62	2020218	Computational Chemistry and Modelling	6	2	12	0	6	30	3	49	2020564 2020572 2020570	FNS	
63	2020585	Physical Chemistry in Pharmaceutical and Cosmetics	6	2	24	0	12	0	3	61	2020572	FNS	
64	1150562	Marketing pharmaceutical and cosmetic products	6	2	25	5	0	0	3	67		FNS	
65	2020584	Nutrition	6	2	26	2	4	0	3	65	1030089	FNS	
<b>II.2.2. Specialized knowledge: Pharmaceutical Chemistry (CN1)</b>				<b>18</b>									
<b>II.2.2a. Compulsory</b>				<b>10</b>									
66	2020582	Pharmaceutical Chemistry	6	4	46	14	0	0	4	136	2020568 2020569	FNS	
67	2020587	Pharmaceutical Chemistry Practice	7	2	0	0	0	60	0	40	2020582	FNS	
68	2020588	Pharmaceutics and Pharmaceutical Technology	7	2	26	0	8	0	3	63	1030125 2020582	FNS	
69	2020589	Pharmaceutical Quality Management	7	2	24	4	4	0	3	65	2020582	FNS	
<b>II.2.2b. Optional</b>				<b>8</b>									
70	2020595	Functional food	7	2	26	0	8	0	3	63	2020582	FNS	
71	1030293	Fragrances and cosmetics	7	2	28	0	4	0	3	65	2020572 1030243	FNS	
72	2020596	Drug Design Using an <i>in silico</i> Approach	7	2	15	0	0	30	3	52	2020214 1030089 2020572	FNS	
73	2020597	Traditional pharmacology	7	2	28	0	4	0	3	65	2020582	FNS	
74	2020598	Medicinal Plants	7	2	30	0	0	0	3	67	2020566 2020582	FNS	
75	2020590	Pharmacokinetics	7	2	22	8	0	0	3	67	1030089 2020582	FNS	
<b>II.2.2. Specialized knowledge: Cosmetic Chemistry (CN2)</b>				<b>18</b>									
<b>II.2.2a. Compulsory</b>				<b>10</b>									
76	2020583	Cosmetic chemistry	6	4	51	0	18	0	4	127	2020568 2020569	FNS	
77	2020591	Cosmetic Chemistry Practice	7	2	0	0	0	60	0	40	2020583	FNS	
78	2020592	Cosmetic Manufacturing Technology	7	2	22	6	4	0	3	65	1030125 2020583	FNS	
79	2020593	Cosmetics quality management	7	2	26	0	8	0	3	63	2020583	FNS	

<i>II.2.2b. Optional</i>				<b>8</b>									
80	2020599	Natural cosmetics	7	2	26	0	8	0	3	63	2020583	FNS	
81	2020600	Functional Cosmetics	7	2	24	0	12	0	3	61	2020583	FNS	
82	2020594	Design and development of cosmetic products	7	2	25	0	10	0	3	62	2020583	FNS	
83	2020601	Cosmeceuticals in skincare	7	2	24	0	12	0	3	61	2020566 2020583	FNS	
84	2020603	Cosmetic Pharmacology	7	2	26	0	8	0	3	63	2020566 2020583	FNS	
85	2020602	Cosmetic Materials	7	2	26	0	8	0	3	63	2020583	FNS	
<b>II.3. Supplementary Knowledge</b>				<b>31</b>									
<b>II.3.1. Professional training</b>				<b>23</b>									
86	2020563	Laboratory techniques and occupational safety	2	1	12	1	0	4	3	30		FNS	
87	2020462	General Chemistry Practice	3	2	0	0	0	60	0	40	2020564	FNS	
88	2020146	Critical thinking and problem-solving skills	4	2	15	10	10	0	3	62	2030003	FNS	
89	2020147	Time Management and Teamwork Skills	3	2	21	0	0	18	3	58		FNS	
90	2020214	Applications of information technology in chemistry	3	2	12	0	6	30	3	49	2020564 1050240	FNS	
91	2020571	Inorganic Chemistry Practice	4	2	0	0	0	60	0	40	2020568	FNS	
92	2020573	Organic Chemistry Practice	4	2	0	0	0	60	0	40	2020569	FNS	
93	2020220	Natural Products Chemistry Practice	5	1	0	0	0	30	0	20	1030243	FNS	
94	2020574	Physical Chemistry Practice	5	2	0	0	0	60	0	40	2020572	FNS	
95	2020576	Analytical Chemistry Practice	5	2	0	0	0	60	0	40	1030274	FNS	
96	2020579	Practice on physicochemical methods of analysis	6	1	0	0	0	30	0	20	2020575	FNS	
97	2020578	English for pharmaceutical and cosmetic chemistry	7	2	24	4	4	0	3	65	2020570	FNS	
98	2020208	Statistical Methods in Chemistry	4	2	14	0	2	30	3	51	1010474 2020214	FNS	
<b>II.3.2. Internships</b>				<b>8</b>									
99	2020586	Production reality	7	1	0	0	0	0	45	5	2020582 (CN1) 2020583 (CN2)	FNS	
100	2020203	Chemistry Field Trip	6	2	0	0	0	0	90	10	2020572 1030274	FNS	
101	2020239	Graduation Internship	8	5	0	0	0	0	225	25	2020203 2020582 (CN1) 2020583 (CN2)	FNS	
<b>II.4. Graduation Thesis, Alternative courses</b>				<b>6</b>						300			
102	2020240	Graduation Thesis	8	6	0	0	0	0	270	30	2020582 (CN1) 2020583 (CN2)	FNS	
		<b>Alternative courses: Pharmaceutical chemistry</b>											
103	2020604	Advanced pharmaceutical chemistry	8	3	36	0	18	0	4	92	2020582	FNS	
104	2020605	Professional opportunities for pharmaceutical chemistry	8	3	36	0	18	0	4	92	2020582	FNS	
		<b>Alternative courses: Cosmetic chemistry</b>											
105	2020606	Advanced cosmetic chemistry	8	3	36	0	18	0	4	92	2020583	FNS	
106	2020607	Professional opportunities for cosmetic chemistry	8	3	36	0	18	0	4	92	2020583	FNS	
<b>Total</b>				<b>135</b>									

(FNS: Faculty of Nature Sciences, FIT: Faculty of Information Technology, FFBA: Faculty of Finance-Banking and Business Administration, FPTLSM: Faculty of Political Theory – Law and State Management, FPE: Faculty of Physical Education, CNDSE: Center of National Defense and Security Education, FSSH: Faculty of Social Sciences and Humanities, FFL: Faculty of Foreign Languages, FMS: Faculty of Mathematics and Statistics)

## 9. TENTATIVE TEACHING PLAN

### Semester 1:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
1	1130299	Philosophy of marxism and leninism	3	40	0	10	0	4	96		FPTLSM	
2	1010474	Advanced Mathematics, Probability and Statistics	3	30	15	0	0	4	101		FMS	
3	2020561	General Physics	2	20	8	4	0	3	65		FNS	
4	1050390	Basic informatics	3	24	6	0	30	4	86		FIT	
5	2020562	An introduction to chemistry	1	12	0	6	0	3	29		FNS	
6	2020196	General Chemistry 1	2	20	10	0	0	3	67		FNS	
7	1090061	English 1	3	30	15	0	0	4	101		FFL	
<b>Select 1 in 7 courses:</b>												
1	1120172	<i>Physical Education 1 (Football 1) (*)</i>	1	4	0	0	26	3	17		FPE	
2	1120175	<i>Physical Education 1 (Volleyball 1) (*)</i>	1	4	0	0	26	3	17		FPE	
3	1120178	<i>Physical Education 1 (Basketball 1) (*)</i>	1	4	0	0	26	3	17		FPE	
4	1120181	<i>Physical Education 1 (Badminton 1) (*)</i>	1	4	0	0	26	3	17		FPE	
5	1120184	<i>Physical Education 1 (Vietnamese Traditional Martial Arts 1) (*)</i>	1	4	0	0	26	3	17		FPE	
6	1120187	<i>Physical Education 1 (Taekwondo Martial Arts 1) (*)</i>	1	4	0	0	26	3	17		FPE	
7	1120190	<i>Physical Education 1 (Karatedo Martial Arts 1) (*)</i>	1	4	0	0	26	3	17		FPE	
<b>Total: 18 credits (17 compulsory + 0 optional + 1 physical education)</b>												

### Semester 2:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						

1	1130300	Political economics of marxism and leninism	2	27	0	6	0	3	64	1130299	FPTLSM	
2	1130049	General law	2	27	0	6	0	3	64	1130299	FPTLSM	
3	2020564	General Chemistry 2	2	20	10	0	0	3	67	2020196	FNS	
4	2020563	Laboratory techniques and occupational safety	1	12	1	0	4	3	30		FNS	
5	2020198	Inorganic Chemistry 1	2	23	7	0	0	3	67	2020196	FNS	
6	2020565	Organic chemistry (part 1)	2	25	5	0	0	3	67	2020196	FNS	
7	2030003	Communication Skills	2	18	0	4	20	3	55		FSSH	
8	1090166	English 2	4	40	20	0	0	4	136	1090061	FFL	
<b>Select 1 in 7 courses:</b>												
1	1120173	<i>Physical Education 2 (Football 2) (*)</i>	1	4	0	0	26	3	17	1120172	FPE	
2	1120176	<i>Physical Education 2 (Volleyball 2) (*)</i>	1	4	0	0	26	3	17	1120175	FPE	
3	1120179	<i>Physical Education 2 (Basketball 2) (*)</i>	1	4	0	0	26	3	17	1120178	FPE	
4	1120182	<i>Physical Education 2 (Badminton 2) (*)</i>	1	4	0	0	26	3	17	1120181	FPE	
5	1120185	<i>Physical Education 2 (Vietnamese Traditional Martial Arts 2) (*)</i>	1	4	0	0	26	3	17	1120184	FPE	
6	1120188	<i>Physical Education 2 (Taekwondo Martial Arts 2) (*)</i>	1	4	0	0	26	3	17	1120187	FPE	
7	1120191	<i>Physical Education 2 (Karatedo Martial Arts 2) (*)</i>	1	4	0	0	26	3	17	1120190	FPE	
<b>Total: 18 credits (17 compulsory + 0 optional + 1 physical education)</b>												

### Semester 3:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
1	1130301	Scientific socialism	2	27	0	6	0	3	64	1130300	FPTLSM	
2	2020569	Organic chemistry (part 2)	3	34	11	0	0	4	101	2020565	FNS	
3	2020201	Chemistry of qualitative analysis	2	22	4	8	0	3	63	2020568 2020569	FNS	
4	2020568	Inorganic Chemistry 2	3	30	12	6	0	4	98	2020198	FNS	
5	2020200	Physical Chemistry 1	2	22	8	0	0	3	67	1010474 2020561 2020564	FNS	
6	2020147	Time Management and Teamwork Skills	2	21	0	0	18	3	58		FNS	

7	2020462	General Chemistry Practice	2	0	0	0	60	0	40	2020564	FNS	
8	2020214	Applications of information technology in chemistry	2	12	0	6	30	3	49	2020564 1050240	FNS	
<b>Select 1 in 7 courses:</b>												
1	1120174	<i>Physical Education 3 (Football 3) (*)</i>	1	4	0	0	26	3	17	1120173	FPE	
2	1120177	<i>Physical Education 3 (Volleyball 3) (*)</i>	1	4	0	0	26	3	17	1120176	FPE	
3	1120180	<i>Physical Education 3 (Basketball 3) (*)</i>	1	4	0	0	26	3	17	1120179	FPE	
4	1120183	<i>Physical Education 3 (Badminton 3) (*)</i>	1	4	0	0	26	3	17	1120182	FPE	
5	1120186	<i>Physical Education 3 (Vietnamese Traditional Martial Arts 3) (*)</i>	1	4	0	0	26	3	17	1120185	FPE	
6	1120189	<i>Physical Education 3 (Taekwondo Martial Arts 3) (*)</i>	1	4	0	0	26	3	17	1120188	FPE	
7	1120192	<i>Physical Education 3 (Karatedo Martial Arts 3) (*)</i>	1	4	0	0	26	3	17	1120191	FPE	
<b>Total: 19 credits (18 compulsory + 0 optional + 1 physical education)</b>												

#### Semester 4:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
1	1030243	The chemistry of natural products	2	12	12	12	0	3	61	2020569	FNS	
2	1030274	Quantitative analysis of chemistry	2	22	6	4	0	3	65	2020201	FNS	
3	2020572	Physical Chemistry 2	3	33	8	8	0	4	97	2020200	FNS	
4	2020146	Critical thinking and problem-solving skills	2	15	10	10	0	3	62	2030003	FNS	
5	1130302	History of the Vietnamese Communist Party	2	27	0	6	0	3	64	1130301	FPTLSM	
6	2020566	General Biology	2	30	0	0	0	3	67		FNS	
7	2020573	Organic Chemistry Practice	2	0	0	0	60	0	40	2020569	FNS	
8	2020571	Inorganic Chemistry Practice	2	0	0	0	60	0	40	2020568	FNS	
9	2020208	Statistical Methods in Chemistry	2	14	0	2	30	3	51	1010474 2020214	FNS	
10	1120168	<i>National Defense and Security Policy of the Communist Party of VietNam (*)</i>	3	37	0	8	0	4	101		CNDSE	

11	1120169	National Defense and Security Works (*)	2	22	0	8	0	3	67	1120168	CNDSE	
12	1120170	General Military (*)	2	14	0	0	16	3	67	1120169	CNDSE	
13	1120171	Infrantry Combat Techniques and Tactics (*)	2	4	0	0	56	3	37	1120170	CNDSE	
<b>Total: 28 credits (19 compulsory + 0 optional + 9 national defense and security education)</b>												

### Semester 5:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
1	2020575	Methods of physical and chemical analysis	2	24	2	8	0	3	63	1030274	FNS	
2	2020217	Green Chemistry	2	25	0	10	0	3	62	2020568 2020569	FNS	
3	1030089	Biochemistry	2	26	0	8	0	3	63	2020566 2020569	FNS	
4	1150422	Start up	2	25	0	10	0	3	67	1130300	FFBA	
5	1030125	Process and equipment of chemical technology	2	26	0	8	0	3	63	2020200	FNS	
6	2020220	Natural Products Chemistry Practice	1	0	0	0	30	0	20	1030243	FNS	
7	2020576	Analytical Chemistry Practice	2	0	0	0	60	0	40	1030274	FNS	
8	2020574	Physical Chemistry Practice	2	0	0	0	60	0	40	2020572	FNS	
9	2020570	English for Chemistry Students	2	24	4	4	0	3	65	1090166	FNS	
10	1130091	Ho Chi Minh thought	2	27	0	6	0	3	64	1130302	FPTLSM	
<b>Total: 19 credits (19 compulsory + 0 optional)</b>												

### Semester 6:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
<b>Compulsory courses</b>			<b>11</b>									
1	2020580	Organic synthesis in medicinal chemistry and cosmetics	2	18	12	0	0	3	67	1030243	FNS	
2	2020581	Application Of Spectroscopy Methods In Pharmaceutical And Cosmetic Analysis	2	16	14	0	0	3	67	2020568 2020569	FNS	
3	2020579	Practice on physicochemical methods of analysis	1	0	0	0	30	0	20	2020575	FNS	
4	2020203	Chemistry Field Trip	2	0	0	0	0	90	10	2020572 1030274	FNS	

<i>Pharmaceutical Chemistry</i>			<b>4</b>									
1	2020582	Medicinal Chemistry	4	46	14	0	0	4	136	2020568 2020569	FNS	
<i>Cosmetic Chemistry</i>			<b>4</b>									
2	2020583	Cosmetic chemistry	4	51	0	18	0	4	127	2020568 2020569	FNS	
<b>Optional courses (select 6/14 credits)</b>			<b>6</b>									
1	2020584	Nutrition	2	26	2	4	0	3	65	1030089	FNS	
2	2020218	Computational Chemistry and Modelling	2	12	0	6	30	3	49	2020564 2020572 2020570	FNS	
3	2020212	Technical Chemistry	2	22	4	8	0	3	63	2020568 2020569 2020572	FNS	
4	2020585	Physical Chemistry in Pharmaceutical and Cosmetics	2	24	0	12	0	3	61	2020572	FNS	
5	1150562	Marketing pharmaceutical and cosmetic products	2	25	5	0	0	3	67			
6	1150563	Supply chain management and produce traceability	2	25	5	0	0	3	67		FFBA	
7	2020577	Microbiology	2	26	0	8	0	3	63	2020566	FNS	
<b>Total: 17 credits (11 compulsory + 6 optional)</b>												

## Semester 7:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
<b>Compulsory courses</b>			<b>9</b>									
1	2020586	Production reality	1	0	0	0	0	45	5	2020582 (CN1) 2020583 (CN2)	FNS	
2	2020578	English for pharmaceutical and cosmetic chemistry	2	24	4	4	0	3	65	2020570	FNS	
<i>Pharmaceutical Chemistry</i>			<b>6</b>									
1	2020588	Pharmaceutics and Pharmaceutical Technology	2	26	0	8	0	3	63	1030125 2020582	FNS	
2	2020589	Pharmaceutical Quality Management	2	24	4	4	0	3	65	2020582	FNS	
3	2020587	Pharmaceutical Chemistry Practice	2	0	0	0	60	0	40	2020582	FNS	
<i>Cosmetic Chemistry</i>			<b>6</b>									
1	2020592	Cosmetic Manufacturing Technology	2	22	6	4	0	3	65	1030125 2020583	FNS	
2	2020593	Cosmetics quality management	2	26	0	8	0	3	63	2020583	FNS	
3	2020591	Cosmetic Chemistry Practice	2	0	0	0	60	0	40	2020583	FNS	
<b>Optional courses (select 8/12 credits)</b>			<b>8</b>									

<i>Pharmaceutical Chemistry</i>											
1	2020597	Traditional pharmacology	2	28	0	4	0	3	65	2020582	FNS
2	2020590	Pharmacokinetics	2	22	8	0	0	3	67	1030089 2020582	FNS
3	1030293	Fragrances and cosmetics	2	28	0	4	0	3	65	2020572 1030243	FNS
4	2020596	Drug Design Using an <i>in silico</i> Approach	2	15	0	0	30	3	52	2020214 1030089 2020572	FNS
5	2020595	Functional food	2	26	0	8	0	3	63	2020582	FNS
6	2020598	Medicinal Plants	2	30	0	0	0	3	67	2020566 2020582	FNS
<i>Cosmetic Chemistry</i>											
1	2020603	Cosmetic Pharmacology	2	26	0	8	0	3	63	2020566 2020583	FNS
2	2020601	Cosmeceuticals in skincare	2	24	0	12	0	3	61	2020566 2020583	FNS
3	2020600	Functional Cosmetics	2	24	0	12	0	3	61	2020583	FNS
4	2020599	Natural cosmetics	2	26	0	8	0	3	63	2020583	FNS
5	2020602	Cosmetic Materials	2	26	0	8	0	3	63	2020583	FNS
6	2020594	Design and development of cosmetic products	2	25	0	10	0	3	62	2020583	FNS
<b>Total: 17 credits (9 compulsory + 8 optional)</b>											

### Semester 8:

No	Course Code	Course Name	Semester	Number of credits			Class Time Schedule	Experimental/Practical	Others	Self-study time	Prerequisite Course Code	Managing Faculty
				LT	BT	TL						
<b>Compulsory courses</b>			<b>5</b>									
1	2020239	Graduation Internship	5	0	0	0	0	225	25	2020203 2020582 (CN1) 2020583 (CN2)	FNS	
<b>Graduation Thesis</b>			<b>6</b>									
1	2020240	Graduation Thesis	6	0	0	0	0	270	30	2020582 (CN1) 2020583 (CN2)	FNS	
<b>Alternative courses</b>			<b>6</b>									
<i>Pharmaceutical Chemistry</i>			<b>6</b>									
1	2020604	Advanced pharmaceutical chemistry	3	36	0	18	0	4	92	2020582	FNS	
2	2020605	Professional opportunities for pharmaceutical chemistry	3	36	0	18	0	4	92	2020582	FNS	
<i>Cosmetic Chemistry</i>			<b>6</b>									

1	2020606	Advanced cosmetic chemistry	3	36	0	18	0	4	92	2020583	FNS	
2	2020607	Professional opportunities for cosmetic chemistry	3	36	0	18	0	4	92	2020583	FNS	
<b>Total: 11 credits (5 compulsory + 6 optional)</b>												

## 10. GUIDELINES FOR PROGRAM IMPLEMENTATION

+ This training program is implemented beginning with the 2024 enrollment cohort of Chemistry students.

+ The training process is conducted in accordance with the designed curriculum, program objectives, and human resource requirements. For elective courses, the faculty provides guidance to students to help them select courses that align with their interests, abilities, and career goals, while also reflecting current development trends and societal needs.

+ The Dean of the Faculty is responsible for organizing and guiding the development of detailed syllabi to ensure alignment with program objectives, content requirements, and the needs of learners and society.

+ The training program is reviewed and updated every 2–3 years to respond to advancements in the field of chemistry and to meet the evolving demands of daily life, industry, science, and technology.

*Binh Dinh, June 20<sup>th</sup>, 2024*

**DEAN OF THE FACULTY**

**HEAD OF TRAINING  
OFFICE**

**BY THE DELEGATION OF  
THE RECTOR  
VICE-RECTOR**

**Assoc. Prof. Dr. Phan Thanh  
Hai**

**Dr. Le Xuan Vinh**

**Dr. Đinh Anh Tuan**