

MINISTRY OF EDUCATION AND TRAINING
QUY NHON UNIVERSITY



UNDERGRADUATE PROGRAM

Level: **Undergraduate**

Major: **Information Technology**

Specialization: **1. Software Engineering;**

2. Information Systems;

3. Cybersecurity and Computer Network Security;

4. Computer Science;

Program Code: **7480201**

Mode of study: **Full-time**

Gia Lai, 2025

UNDERGRADUATE PROGRAM

*(Issued in conjunction with Decision No. 2094/QĐ-ĐHQN dated July 22, 2025
by the Rector of Quy Nhon University)*

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1. PROGRAM OBJECTIVES (POs)

1.1. General objectives

The Bachelor of Information Technology program aims to educate graduates who possess both fundamental and advanced knowledge in Information Technology, strong practical competencies, and the ability to creatively apply IT knowledge to address real-world problems. Graduates are expected to demonstrate professional responsibility, ethical integrity, and a strong commitment to self-directed learning and research in order to adapt to rapid advancements in science and technology. The program is designed to meet the demands of national socio-economic development, contribute to national defense and security, and support international integration. The Information Technology program offers four specializations. In addition to the general objectives, the program establishes specific educational objectives for each specialization as follows:

- + Software Engineering: Provide students with fundamental and advanced knowledge of software development processes, including the construction, management, and maintenance of software systems; software analysis, design, and project management. Students develop competencies in organizing, managing, implementing, and developing software projects across desktop, web, mobile, and cloud computing environments.
- + Information Systems: Equip students with foundational and advanced knowledge in data management, data analytics, data processing, big data technologies, and knowledge discovery from data. Students develop competencies in designing and developing information systems for economic management, public administration, and service sectors.

+ Cybersecurity and Computer Network Security: Provide in-depth knowledge of information security, system security, data protection, and cybersecurity. Students develop competencies in detecting, preventing, and responding to cyber incidents and attacks, thereby safeguarding information assets of individuals, organizations, and the nation. The specialization enhances students' abilities to analyze, design, implement, and operate advanced cybersecurity systems, as well as to conduct security testing, manage risks, and develop security policies aligned with national and international standards.

+ Computer Science: Provide students with strong foundational knowledge in computer science and advanced expertise in machine learning, computer vision, and natural language processing. Students develop competencies in designing and developing intelligent systems and applications.

1.2. Specific objectives

The Bachelor of Information Technology program equips students with the following competencies:

1) PO1. Professional Knowledge and Practical Competence. Graduates possess comprehensive disciplinary knowledge and professional skills in Information Technology, enabling them to effectively perform technical and professional tasks in real-world contexts.

2) PO2. Vision, Critical Thinking, and Problem-Solving Capacity. Graduates demonstrate strategic vision, critical thinking, and proactive collaboration skills to analyze and address challenges at organizational, local, national, and regional levels.

3) PO3. Innovation, Digital Competence, and Lifelong Learning. Graduates exhibit innovation capacity, digital literacy, and an entrepreneurial mindset, together with the ability for self-directed learning and lifelong professional development in response to technological advancements.

4) PO4. Professional Ethics and Social Responsibility. Graduates uphold ethical standards, professional responsibility, and a strong commitment to community engagement and public service.

2. JOB OPPORTUNITIES AND PROFESSIONAL DEVELOPMENT

Graduates who have successfully completed the training program may assume the following professional positions and pursue advanced academic studies:

- Software Developer; Software Engineering Specialist
- Data Analyst; Data Science Specialist
- Systems Administrator; Network Administrator
- Information Security Specialist
- Artificial Intelligence and Machine Learning Specialist
- IT Project Manager; Technology Consultant
- Researcher or Lecturer in Information Technology at universities, institutes, research centers, and other educational institutions specializing in Information Technology
- Pursue further academic advancement at the Master's and Doctoral levels in

disciplines related to Information Technology

3. LEARNING OUTCOMES

Program Learning Outcomes (PLOs)

Upon completion of the Bachelor's program in Information Technology, graduates are expected to demonstrate the following competencies:

[1] PLOs	[2] Pis
PLO1: Apply knowledge of political science, relevant laws and regulations, and foundational concepts related to information collection, storage, and processing to address practical tasks in professional and social contexts.	1.1. Identify relevant knowledge of political science, legal frameworks, and principles of information collection, storage, and processing for professional engagement.
	1.2. Apply knowledge of political science, law, and information management principles to perform specific stages of professional tasks.
PLO2: Apply knowledge related to software, hardware, databases, computer networks, cybersecurity, and emerging technologies such as artificial intelligence, machine learning, and blockchain; employ scientific and engineering principles to solve real-world problems.	2.1. Identify knowledge related to software, hardware, databases, computer networks, cybersecurity, and emerging technologies such as artificial intelligence, machine learning, and blockchain; and apply scientific and engineering principles to address professional problems.
	2.2. Conduct experimental implementation and evaluation of proposed solutions in specific contexts.
PLO3: Demonstrate effective communication skills within the field of Information Technology.	3.1. Select appropriate presentation methods to effectively communicate ideas and issues related to Information Technology.
	3.2. Produce and present written documents in the field of Information Technology
	3.3. Read and comprehend English-language materials relevant to Information Technology.
PLO4: Utilize systematic processes for information extraction and processing to perform professional tasks.	4.1. Identify appropriate procedures for data extraction and processing in addressing domain-specific problems.
	4.2. Collect and process data from multiple sources to accomplish professional assignments.
PLO5: Demonstrate the ability to work effectively in teams to accomplish shared objectives.	5.1. Establish and organize working teams.
	5.2. Develop team activity plans to achieve defined goals.
	5.3. Actively contribute to team performance and collaborative outcomes.

PLO6: Demonstrate self-directed learning, research capability, and a commitment to lifelong learning..	6.1. Exhibit autonomy and accountability in learning through proactive acquisition of knowledge and information from diverse sources.
	6.2. Demonstrate the ability to search for, synthesize, and transform information into applicable knowledge for problem-solving.
PLO7: Demonstrate ethical awareness and professional responsibility in making professional judgments and evaluations in the field of Information Technology.	7.1. Identify ethical issues and professional responsibilities arising in Information Technology practice.
	7.2. Provide professional judgments and evaluations grounded in ethical principles, professional responsibility, and an understanding of their broader impacts.

4. PROGRAM DURATION AND TOTAL ACADEMIC WORKLOAD

4.1. Program Duration: 04 years

4.2. Total academic workload: 135 (excluding Physical Education and National Defense and Security Education)

#No.	Knowledge Block; Number of Credits	Number of Credits	
		Required	Elective
1	<i>General Education Knowledge</i>	24	0
1.1	Political Science and Law	13	0
1.2	Foreign Language	7	0
1.3	Social Sciences / Mathematics, Natural Sciences and Environment, Management Sciences	4	0
2	<i>Professional Knowledge</i>	102	9
2.1	Fundamental knowledge	60	0
2.2	Specialized knowledge	27	9
2.3	Supplementary Knowledge	5	0
2.4	Internship	4	0
2.5	Bachelor thesis, Alternative courses	6	0
Total:		126	9
		135	

5. ADMISSION REQUIREMENTS

5.1. Admission Requirements

Applicants must meet the following requirements: Graduation from upper secondary school (or an equivalent qualification) in accordance with current admission regulations; a genuine interest in the chosen field of study; good physical health; sound political and ethical qualities with a strong sense of social responsibility; a solid foundation of upper secondary school knowledge; the ability to work independently, think creatively, and engage in scientific research; and the capacity to adapt to the evolving technological environment and global digital transformation.

5.2. Admission Methods

The admission methods for the Information Technology program include: admission based on the results of the National High School Graduation Examination; admission based on upper secondary school academic records; direct admission for students who have achieved national-level academic excellence awards; and admission based on the results of competency or aptitude assessment examinations. These admission methods are implemented in accordance with the University's annual admission plan, which is publicly announced on the University's official admissions website (<https://tuyensinh.qnu.edu.vn/>).

6. TRAINING METHOD, GRADUATION REQUIREMENTS

6.1. Training Method: Credit-based training system

6.2. Graduation Requirements:

- Academic Requirements: In accordance with the current undergraduate training regulations issued by the Ministry of Education and Training and the existing undergraduate training regulations of Quy Nhon University. Students must complete all required courses and the total credit requirements of the program; achieve a cumulative Grade Point Average (GPA) of at least 2.00; and satisfy all Program Learning Outcomes (PLOs).

- Physical Education and National Defense – Security Education: Fulfill the requirements and obtain the Certificate of National Defense and Security Education.

- Foreign Language Requirement: Meet the foreign language proficiency standard as prescribed by the University.

7. TEACHING METHODS AND LEARNING ASSESSMENT

7.1 Teaching Methods

The teaching methods employed in the Information Technology training program consist of a variety of teaching and learning activities designed to help learners acquire not only fundamental professional knowledge and social knowledge but also the ability to apply such knowledge collaboratively. Through these activities, students develop essential personal competencies such as communication, negotiation, and teamwork skills. Specifically, the following teaching approaches are applied:

- Direct Teaching: Direct teaching is an instructional approach in which information is delivered directly to learners, with the lecturer presenting the material while students

listen and take notes. This method is commonly used in traditional classroom settings and is particularly effective when instructors aim to convey fundamental knowledge or explain new concepts and skills. Teaching methods applied under this approach include Lectures and Guest Lectures.

- **Indirect Teaching:** Indirect teaching is an instructional approach in which learners are facilitated during the learning process without explicit or continuous direct instruction from the lecturer. This learner-centered approach encourages active participation, allowing students to engage in the learning process and apply critical thinking skills in problem-solving. Teaching methods applied under this approach include Case-Based Learning, Problem-Based Learning, and Inquiry-Based Learning.

- **Experiential Learning:** Experiential learning is a teaching approach in which learners acquire knowledge and skills through practical experience, real-world observation, and personal reflection. Students learn by doing and through direct engagement with practical activities. Methods applied under this approach include Experiential Learning, Internships, Field Trips, Simulations, and Practice-based Activities.

- **Interactive Teaching:** Interactive teaching is an instructional approach in which learners engage in a combination of classroom activities such as problem posing, guiding questions, discussions, and debates to address specific issues. The instructor acts as a facilitator who guides learners step by step in solving problems, thereby helping them achieve the intended learning outcomes. Through interaction with peers and instructors, students develop social skills, critical thinking, communication, and negotiation skills necessary for decision-making. Methods applied include Interactive Lectures, e-Learning, and Group Exercises.

- **Self-directed Learning:** Self-directed learning refers to learning activities undertaken independently by students with minimal or no direct supervision from instructors. This process enables learners to manage and direct their own learning based on their prior experiences, allowing them to exercise autonomy and take responsibility for their learning activities through assignments, projects, or problems suggested and guided by instructors in class. Methods applied under this strategy mainly include Work Assignments and Self-Directed Learning.

7.2 Learning Assessment

- **Grading scale:** A 10-point grading scale is used for all assessment forms in each course.

- **Assessment Forms, Criteria, and Weighting**

- a. Theoretical Courses:**

- **Assessment Forms:** Written examination (Essay), Oral examination, Practical assessment, and Term paper.

- **Assessment Criteria:** Evaluation is conducted in accordance with the official answer keys or marking schemes of the examination.

- **Score Weighting:** Determined according to the course syllabus. The final examination must account for at least 50% of the total score. Common midterm–final weighting structures in the program include 30%–70%, 40%–60%, and 50%–50%.

b. Practical Courses:

Students are required to attend and complete all laboratory and practical sessions. The final grade for the practical course is calculated as the average score of all practical exercises during the semester, rounded to one decimal place.

c. Course Project, Introductory Internship, and Graduation Internship:

- 50% Continuous assessment
- 50% Oral examination

d. Graduation Thesis:

Assessment is conducted in accordance with the Undergraduate Training Regulations issued together with Decision No. 1487/QĐ-ĐHQN dated July 1, 2021, by Quy Nhon University.

Assessment Methods

The assessment methods used in the Information Technology training program are classified into two main types:

- Formative Assessment (continuous assessment during the learning process)
- Summative Assessment (final evaluation of learning outcomes).

8. PROGRAM CONTENT

No	Course Code	Course	Semester	Number of credits	Class duration			Experimental/ Practical	Others	Self-study time	Prerequisite Course Code	Department in charge	Note
					Theor y	Practis e	Tests						
I. General Education Knowledge				24									
Required													
I.1. Political Science and Law				13									
1	1130299	Marxist–Leninist Philosophy	1	3	40	0	10	0		85		DPSLM	
2	1130300	Marxist–Leninist Political Economy	2	2	27	0	6	0		57		DPSLM	
3	1130301	Scientific Socialism	3	2	27	0	6	0		57		DPSLM	
4	1130302	History of the Communist Party of Vietnam	4	2	27	0	6	0		57		DPSLM	
5	1130091	Ho Chi Minh Thought	5	2	27	0	6	0		57		DPSLM	
6	1130049	Introduction to Law	2	2	27	0	6	0		57		DPSLM	
I.2. Excluding Physical Education and National Defense - Security Education				12									
I.2.1. Physical Education: Students choose one of the seven Physical Education course groups listed below				3									
7	1120172	Physical Education 1 (Football 1)	1	1	4	0	0	26		21		DPE	
8	1120173	Physical Education 2 (Football 2)	2	1	4	0	0	26		21	1120172	DPE	
9	1120174	Physical Education 3 (Football 3)	3	1	4	0	0	26		21	1120173	DPE	
10	1120175	Physical Education 1 (Volleyball 1)	1	1	4	0	0	26		21		DPE	
11	1120176	Physical Education 2 (Volleyball 2)	2	1	4	0	0	26		21	1120175	DPE	

12	1120177	Physical Education 3 (Volleyball 3)	3	1	4	0	0	26		21	1120176	DPE	
13	1120178	Physical Education 1 (Basketball 1)	1	1	4	0	0	26		21		DPE	
14	1120179	Physical Education 2 (Basketball 2)	2	1	4	0	0	26		21	1120178	DPE	
15	1120180	Physical Education 3 (Basketball 3)	3	1	4	0	0	26		21	1120179	DPE	
16	1120181	Physical Education 1 (Badminton 1)	1	1	4	0	0	26		21		DPE	
17	1120182	Physical Education 2 (Badminton 2)	2	1	4	0	0	26		21	1120181	DPE	
18	1120183	Physical Education 3 (Badminton 3)	3	1	4	0	0	26		21	1120182	DPE	
19	1120184	Physical Education 1 (Vietnamese Traditional Martial Arts 1)	1	1	4	0	0	26		21		DPE	
20	1120185	Physical Education 2 (Vietnamese Traditional Martial Arts 2)	2	1	4	0	0	26		21	1120184	DPE	
21	1120186	Physical Education 3 (Vietnamese Traditional Martial Arts 3)	3	1	4	0	0	26		21	1120185	DPE	
22	1120187	Physical Education 1 (Taekwondo 1)	1	1	4	0	0	26		21		DPE	
23	1120188	Physical Education 2 (Taekwondo 2)	2	1	4	0	0	26		21	1120187	DPE	
24	1120189	Physical Education 3 (Taekwondo 3)	3	1	4	0	0	26		21	1120188	DPE	
25	1120190	Physical Education 1 (Karatedo 1)	1	1	4	0	0	26		21		DPE	
26	1120191	Physical Education 2 (Karatedo 2)	2	1	4	0	0	26		21	1120190	DPE	
27	1120192	Physical Education 3 (Karatedo 3)	3	1	4	0	0	26		21	1120191	DPE	
I.2.2. National Defense and Security Education				9									
28	1120168	National Defense and Security Education 1	2	3	37	0	8	0		82		CNDSE	

29	1120169	National Defense and Security Education 2	2	2	22	0	8	0		52		CNDSE	
30	1120170	National Defense and Security Education 3	2	2	14	0	0	16		44		CNDSE	
31	1120171	National Defense and Security Education 4	2	2	4	0	0	56		64		CNDSE	
I.3. Foreign Language				7									
32	1090061	English 1	1	3	32	5	6	0		90		DFL	
33	1090166	English 2	2	4	48	8	8	0		120	1090061	DFL	
I.4. Social Sciences				4									
34	1150422	Entrepreneurship	5	2	20	5	10	0		35		DPE	
35	2030003	Communication Skills	2	2	20	5	0	10		35		DPE	
II. Professional Education Knowledge				111									
II.1. Disciplinary and Major Foundations				60									
36	1010245	Calculus	1	3	33	12	0	0		90		DMS	
37	1010038	Linear Algebra	1	3	33	12	0	0		90		DMS	
38	1010126	Probability and Statistics	3	3	33	12	0	0		90	1010245	DMS	
39	1050075	Discrete Mathematics	3	3	33	12	0	0		90		DIT	
40	1010387	Numerical Methods	2	3	30	15	0	0		90	1010038	DMS	
41	1050074	Mathematical Logic	4	2	24	6	0	0		60		DIT	
42	1050273	Basic Programming	1	3	20	10	0	30		90		DIT	
43	1050275	Introduction to Information Technology	1	1	10	0	10	0		30		DIT	
44	1050016	Database Management Systems	2	3	25	5	0	30		80		DIT	

45	1050043	Introduction to Computer Networks	3	3	30	0	0	30		90	1050124	DIT	
46	1050333	Data Structures	3	3	22	8	0	30		80	1050273	DIT	
47	1050040	Introduction to Databases	4	3	33	12	0	0		90		DIT	
48	1050024	Object-Oriented Programming	3	3	22	8	0	30		90	1050273	DIT	
49	1050058	Computer Network Administration	5	3	30	0	0	30		75	1050043	DIT	
50	1050274	Introduction to Algorithms	2	3	27	18	0	0		90	1050273	DIT	
51	1050112	Introduction to Artificial Intelligence	5	3	35	5	10	0		85		DIT	
52	1050276	Programming Techniques	4	3	30	0	0	30		90	1050274	DIT	
53	1050041	Introduction to Software Engineering	5	3	27	9	0	18		80		DIT	
54	1050279	Desktop Application Programming	4	3	20	10	0	30		75	1050016 1050024	DIT	
55	1050029	Web Application Programming	4	3	30	0	0	30		75	1050273 1050016	DIT	
56	1050037	Operating System Principles	5	3	40	0	0	10		90		DIT	
II.2. Specialization Knowledge													
II.2.1. Software Engineering Specialization			36										
II.2.1a. Required Courses			27										
57	1050324	Modeling Language	6	4	30	10	10	30		85		DIT	
58	1050285	Software Requirements Analysis and Specification	6	4	30	10	10	30		85	1050041	DIT	
59	1050329	Software Testing and Quality Assurance	6	4	30	10	10	30		85	1010126	DIT	
60	1050286	Web Technology	6	3	30	0	0	30		75	1050029	DIT	

61	1050305	Software Design	7	4	30	10	10	30		85	1050285 1050324	DIT	
62	1050165	Object-Oriented Software Development	7	3	30	0	0	30		75	1050024	DIT	
63	1050306	Automated Testing	7	4	30	15	0	30		85	1050041 1050329	DIT	
64	1050284	Cloud Computing	7	3	30	0	0	30		75		DIT	
<i>II.2.1b. Elective Courses</i>				9									
65	1050113	.NET Technology	6	3	30	0	0	30		75		DIT	
66	1050159	Java Technology	6	3	30	0	0	30		75		DIT	
67	1050307	Mobile Programming	7	4	30	0	0	60		90		DIT	
68	1050326	Game Programming	7	4	30	0	0	60		90		DIT	
69	1050330	Open-Source Software Development	7	4	25	0	10	60		95		DIT	
70	1050327	Embedded Systems Programming	7	4	30	0	0	60		90		DIT	
71	1050328	Service-Oriented Architecture	7	2	15	3	0	24		45		DIT	
72	1050162	Software Maintenance	7	2	20	0	0	20		45		DIT	
73	1050160	Professional Software Development	7	2	4	0	0	56		45		DIT	
74	1050158	Software Project Management	7	2	24	0	0	12		45		DIT	
<i>II.2.1. Information Systems Specialization</i>				36									
<i>II.2.1a. Required courses</i>				27									
75	1050280	Information Systems Analysis and Design	6	3	30	0	10	20		75	1050040 1050029	DIT	
76	1050281	Application Programming Technology	6	3	27	0	6	30		75	1050024	DIT	
77	1050282	Advanced Database Systems	6	3	25	5	0	30		75	1050016 1050029	DIT	

78	1050283	Data Mining	6	3	25	5	0	30		75	1050029	DIT	
79	1050304	Information Systems Security	7	3	30	0	10	20		75	1050280 1050282	DIT	
80	1050297	Information Systems Development Practicum	7	3	15	0	0	60		60	1050282 1050151	DIT	
81	1050399	Geographic Information Systems	6	3	30	0	0	30		75		DIT	
82	1050298	Big Data Analytics	7	3	30	0	0	30		75	1050283	DIT	
83	1050284	Cloud Computing	6	3	30	0	0	30		75	1050029 1050043	DIT	
<i>II.2.1b. Elective courses</i>				9									
84	1050147	NoSQL Databases	7	3	30	0	0	30		75		DIT	
85	1050302	Distributed Systems	7	3	30	0	0	30		75		DIT	
86	1050299	Blockchain and Applications	7	3	30	0	0	30		75		DIT	
87	1050303	Electronic Commerce	7	3	24	6	0	30		75		DIT	
88	1050300	Business Intelligence Systems	7	3	30	0	0	30		75	1050016 1050283	DIT	
89	1050301	Data Visualization	7	3	30	0	0	30		75		DIT	
II.2.1. Computer Science Specialization				36									
<i>II.2.1a. Required courses</i>				27									
90	1050396	Artificial Intelligence Tools and Programming	6	4	24	21	0	30		105		DIT	
91	1050293	Advanced Algorithms	6	3	24	6	0	30		75	1050274 1050075	DIT	
92	1050294	Machine Learning	6	4	45	5	0	20		105		DIT	
93	1050295	Digital Image Processing	6	4	45	0	0	30		105	1050112	DIT	

94	1050296	Natural Language Processing	6	4	45	0	0	30		105		DIT	
95	1050314	Deep Learning and Applications	7	4	45	5	0	20		105	1050294	DIT	
96	1050411	Artificial Intelligence System Development	7	4	39	0	0	42		95	1050292 1050294 1050296	DIT	
<i>II.2.1b. Elective courses</i>				9									
97	1050313	Computer Vision	7	3	30	0	0	30		75		DIT	
98	1050403	Large Language Models and Applications	7	3	30	0	0	30		75		DIT	
99	1050316	Time Series Forecasting	7	3	33	12	0	0		90	1010126	DIT	
100	1050283	Data Mining	7	3	25	5	0	30		75		DIT	
101	1050298	Big Data Analytics	7	3	30	0	0	30		75		DIT	
<i>II.2.1 Cybersecurity and Computer Network Security</i>				36									
<i>II.2.1a. Required courses</i>				27									
102	1050404	Network Simulation	6	2	0	0	0	60		30	1050058	DIT	
103	1050402	Cryptography and Applications	6	4	39	0	0	42		105		DIT	
104	1050394	Computer Network Security	6	3	30	0	0	30		75	1050043	DIT	
105	1050413	Secure Network System Administration	6	3	30	0	0	30		75		DIT	
106	1050400	Information Security Testing and Evaluation (Basic Penetration Testing)	6	3	30	0	0	30		75	1050043	DIT	
107	1050408	Network Design and Analysis	6	3	30	0	0	30		75	1050043 1050058	DIT	
108	1050410	Law and Ethics in Information Security	7	2	30	0	0	0		60		DIT	

109	1050409	Cybersecurity Incident Analysis and Response	7	4	39	0	0	42		105	1050043	DIT	
110	1050393	IoT and Mobile Device Security	7	3	30	0	0	30		75		DIT	
II.2.1b. Electives courses				9						0			
111	1050392	Cloud Security	7	3	40	0	0	10		75	1050058	DIT	
112	1050407	Malware Analysis	7	3	30	0	0	30		75	1050058	DIT	
113	1050397	Blockchain Technology and Security	7	3	30	0	0	30		75	1050058	DIT	
114	1050177	Network Performance Evaluation	7	3	30	0	0	30		75	1050058	DIT	
115	1050179	Network Devices	7	3	30	0	0	30		75	1050058	DIT	
116	1050309	Virtualization Technology	7	3	30	0	0	30		75		DIT	
II.3. Supplementary Knowledge				9									
II.3.1. Professional Training and Skills Development				5									
117	1050124	Computer Practice	1	1	0	0	0	30		30		DIT	
118	1050277	English for Information Technology	3	2	20	5	10	0		55	1090166	DIT	
119	1050136	Teamwork Practice	5	2	0	0	0	60		30	1050029 1050085	DIT	
II.3.2. Professional Internship				4									
120	1050278	Introductory Internship	4	1	0	0	0	30	TT	15		DIT	
121	1050138	Graduation Internship	8	3	0	0	0	90	TT	45		DIT	
II.4. Graduation Thesis or Alternative Courses				6									
1050332	Graduation Thesis		8	6	0	0	0	180		90		DIT	

122	Alternative courses		8	6								DIT	
<i>Common courses for all majors</i>													
123	1050115	Contemporary Issues in Information Technology	8	2	30	0	0	0		60	1050041 1050043 1050112	DIT	
<i>Software Engineering specialization</i>													
124	1050406	Contemporary Issues in Software Engineering	8	2	30	0	0	0		60		DIT	
125	1050412	Intelligent Software Development	8	2	30	0	0	0		60		DIT	
<i>Information Systems specialization</i>													
126	1050319	Modern Information Systems	8	2	21	0	18	0		60		DIT	
127	1050320	Contemporary Issues in Data Science	8	2	30	0	0	0		60		DIT	
<i>Cybersecurity and Computer Network Security</i>													
128	1050405	Contemporary Issues in Network Security and Safety	8	2	30	0	0	0		60		DIT	
129	1050401	Modern Computer Networks and Data Communication	8	2	30	0	0	0		60		DIT	
<i>Computer Science specialization</i>													
130	1050398	Generative AI and Applications	8	2	15	0	0	30		60		DIT	
131	1050395	Open Artificial Intelligence Systems	8	2	30	0	0	0		60		DIT	
Total:				135									

* Note: The list of faculties responsible for course management is described as follows:

Acronym	Department Name
DPSLM	Department of Political Science, Law and State Management
DPE	Department of Physical Education
DDPE	Department of Finance, Banking and Business Administration
DSSH	Department of Social Sciences and Humanities
DMS	Department of Mathematics and Statistics
DIT	Department of Information Technology
DFL	Department of Foreign Languages
CNDSE	Center for National Defense and Security Education

10. TENTATIVE TEACHING PLAN

No	Course Code	Course	Num ber of cred its	Knowl edge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Requi red	Restri cted Electi ve	Free Electi ve	Theor y	Pra ctis e	Tests	Ex per ime ntal / Pra tica l	Othe rs	Self - stu dy tim e c	Prerequ isite	Recomm ended Prior Course	
	Semester 1															
1	1090061	English 1	3	1	x			32	5	6	0		90			DFL
2	1130299	Marxist–Leninist Philosophy	3	1	x			40	0	10	0		85			DPSLM

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
3	1010038	Linear Algebra	3	2	x			33	12	0	0		90			DMS
4	1010245	Calculus	3	2	x			33	12	0	0		90			DMS
5	1050275	Introduction to Information Technology	1	2	x			10	0	10	0		30			DIT
6	1050124	Computer Practice	1	4	x			0	0	0	30		30			DIT
7	1050273	Basic Programming	3	2	x			20	10	0	30		90			DIT
Semester 2																
1	1130300	Marxist–Leninist Political Economy	2	1	x			27	0	6	0		57			DPSLM
2	1130049	Introduction to Law	2	1	x			27	0	6	0		57			DPSLM
3	1090166	English 2	4	1	x			48	8	8	0		120		1090061	DFL
4	2030003	Communication Skills	2	1	x			20	5	10	0		57			DSSH
5	1010387	Numerical Methods	3	2	x			30	15	0	0		90			DMS
6	1050274	Introduction to Algorithms	3	2	x			27	18	0	0		90			DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
7	1050016	Database Management Systems	3	2	x			25	5	0	30		80			DIT
	Semester 3															
1	1130301	Scientific Socialism	2	1	x			27	0	6	0		57			DPSLM
2	1010126	Probability and Statistics	3	2	x			33	12	0	0		90			DMS
3	1050333	Data Structures	3	2	x			22	8	0	30		80		1050273	DIT
4	1050075	Discrete Mathematics	3	2	x			33	12	0	0		90			DIT
5	1050043	Introduction to Computer Networks	3	2	x			30	0	0	30		90			DIT
6	1050277	English for Information Technology	2	4	x			20	5	10	0		80		1090166	DIT
7	1050024	Object-Oriented Programming	3	2	x			22	8	0	30		80		1050273	DIT
	Semester 4															
1	1130302	History of the Communist Party of Vietnam	2	1	x			27	0	6	0		57		1140041 1140042	DPSLM
2	1050040	Introduction to Databases	3	2	x			33	12	0	0		90			DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
3	1050276	Programming Techniques	3	2	x			30	0	0	30		90		1050274	DIT
4	1050074	Mathematical Logic	2	2	x			24	6	0	0		60			DIT
5	1050278	Introductory Internship	1	5	x			0	0	0	30	TT	10			DIT
6	1050279	Desktop Application Programming	3	2	x			20	10	0	30		75		1050016 1059924	DIT
7	1050029	Web Application Programming	3	2	x			30	0	0	30		75		1050016 1050273	DIT
Semester 5																
1	1130091	Ho Chi Minh Thought	2	1	x			27	0	6	0		57			DPSLM
2	1150422	Entrepreneurship	2	1	x			20	5	10	0		60			DPE
3	1050058	Computer Network Administration	3	2	x			30	0	0	30		75		1050043	DIT
4	1050037	Operating System Principles	3	2	x			40	0	0	10		90			DIT
5	1050112	Introduction to Artificial Intelligence	3	2	x			35	5	10	0		85			DIT
6	1050041	Introduction to Software Engineering	3	2	x			27	9	0	18		84			DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
7	1050136	Teamwork Practice	2	4	x			0	0	0	60		30			DIT
	Semester 6															
	Software Engineering Specialization															
1	1050324	Modeling Language	4	3	x			30	10	10	30		90			DIT
2	1050285	Software Requirements Analysis and Specification	4	3	x			30	10	10	30		90		1050041	DIT
3	1050329	Software Testing and Quality Assurance	4	3	x			30	10	10	30		90		1010126	DIT
4	1050286	Web Technology	3	3	x			30	0	0	30		75		1050029	DIT
	Choose 1 of the following 2 courses (3 credits)															
5	1050113	.NET Technology	3	3		x		30	0	0	30		75			DIT
6	1050159	Java Technology	3	3		x		30	0	0	30		75			DIT
	Information Systems Specialization															
1	1050280	Information Systems Analysis and Design	3	3	x			30	0	10	20		75		1050040 1050029	DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
2	1050281	Application Programming Technology	3	3	x			27	0	6	30		75		1050024	DIT
3	1050282	Advanced Database Systems Data Mining	3	3	x			25	5	0	30		75		1050016 1050029	DIT
4	1050283	Data Mining	3	3	x			25	5	0	30		75		1050029	DIT
5	1050399	Geographic Information Systems	3	3	x			30	0	0	30		75			DIT
6	1050284	Cloud Computing	3	3	x			30	0	0	30		75		1050043 1050029	DIT
Cybersecurity and Computer Network Security																
1	1050404	Network Simulation	2	3	x			0	0	0	60		30			DIT
2	1050402	Cryptography and Applications	4	3	x			39	0	0	42		95			DIT
3	1050394	Computer Network Security	3	3	x			30	0	0	30		75			DIT
4	1050413	Secure Network System Administration	3	3	x			30	0	0	30		75			DIT
5	1050400	Information Security Testing and Evaluation (Basic Penetration Testing)	3	3	x			30	0	0	30		75			DIT
6	1050408	Network Design and Analysis	3	3	x			30	0	0	30		75			DIT

No	Course Code	Course	Num ber of cred its	Knowl edge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Requi red	Restri cted Electi ve	Free Electi ve	Theor y	Pra ctis e	Tests	Ex per ime ntal / Pra tica l	Othe rs	Self - stu dy tim e c	Prerequ isite	Recomm ended Prior Course	
	Computer Science Specialization															
1	1050396	Artificial Intelligence Tools and Programming	4	3	x			24	21	0	30		105			DIT
2	1050293	Advanced Algorithms	3	3	x			24	6	0	30		75		1050274 1050075	DIT
3	1050294	Machine Learning	4	3	x			45	5	0	20		105			DIT
4	1050295	Digital Image Processing	4	3	x			45	0	0	30		105		1050112	DIT
5	1050296	Natural Language Processing	4	3	x			45	0	0	30		105			DIT
	Semester 7															
	Software Engineering Specialization															
1	1050305	Software Design	4	3	x			30	100	5	30		105		1050285 1050324	DIT
2	1050165	Object-Oriented Software Development	3	3	x			30	0	0	30		75		1050024	DIT
3	1050306	Automated Testing	4	3	x			30	15	0	30		105		1050041 1050329	DIT
4	1050284	Cloud Computing	3	3	x			30	0	0	30		75			DIT

No	Course Code	Course	Num ber of cred its	Knowl edge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Requi red	Restri cted Electi ve	Free Electi ve	Theor y	Pra ctis e	Tests	Ex per ime ntal / Pra tica l	Othe rs	Self - stu dy tim e c	Prerequ isite	Recomm ended Prior Course	
Select 4 credits from the following courses																
5	1050307	Mobile Programming	4	3		x		22	8	0	60		90			DIT
6	1050326	Game Programming	4	3		x		30	0	0	60		90			DIT
7	1050330	Open-Source Software Development	4	3		x		24	2	4	60		90			DIT
8	1050327	Embedded Systems Programming	4	3		x		22	8	0	60		90			DIT
9	1050328	Service-Oriented Architecture	2	3		x		15	3	0	24		75			DIT
10	1050162	Software Maintenance	2	3		x		20	0	0	20		45			DIT
11	1050160	Professional Software Development	2	3		x		9	0	0	42		45			DIT
12	1050158	Software Project Management	2	3		x		20	0	0	20		45			DIT
	Information Systems Specialization															
1	1050304	Information Systems Security	3	3	x			30	0	10	20		75		1050280 1050282	DIT
2	1050297	Information Systems Development Practicum	3	3	x			15	0	0	60		60		1050282 1050151	DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
3	1050298	Big Data Analytics	3	3	x			30	0	0	30		75		1050283	DIT
Select 3 of the following 6 courses (9 credits)																
4	1050147	NoSQL Databases	3	3		x		30	0	0	30		75			DIT
5	1050302	Distributed Systems	3	3		x		30	0	0	30		75			DIT
6	1050299	Blockchain and Applications	3	3		x		25	5	0	30		75			DIT
7	1050303	Electronic Commerce	3	3		x		24	3	6	30		75			DIT
8	1050300	Business Intelligence Systems	3	3		x		20	10	0	30		75		1050016 1050283	DIT
9	1050301	Data Visualization	3	3		x		30	0	0	30		75			DIT
Cybersecurity and Computer Network Security																
1	1050410	Law and Ethics in Information Security	2	3	x			30	0	0	0		60		1050058	DIT
2	1050409	Cybersecurity Incident Analysis and Response	4	3	x			39	15	0	42		105		1050058	DIT
3	1050393	IoT and Mobile Device Security	3	3	x			30	0	0	30		75		1050058	DIT

No	Course Code	Course	Num ber of cred its	Knowl edge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Requi red	Restri cted Electi ve	Free Electi ve	Theor y	Pra ctis e	Tests	Ex per ime ntal / Pra tica l	Othe rs	Self - stu dy tim e c	Prerequ isite	Recomm ended Prior Course	
Select 3 of the following 6 courses (9 credits)																
4	1050392	Cloud Security	3	3		x		30	0	0	30		75		1050058	DIT
5	1050407	Malware Analysis	3	3		x		30	0	0	30		75		1050058	DIT
6	1050397	Blockchain Technology and Security	3	3		x		30	0	0	30		75			DIT
7	1050177	Network Performance Evaluation	3	3		x		30	0	0	30		75		1050058	DIT
8	1050179	Network Devices	3	3		x		30	0	0	30		75		1050058	DIT
9	1050309	Virtualization Technology	3	3		x		30	0	0	30		75		1050058	DIT
	Computer Science Specialization															
1	1050314	Deep Learning and Applications	4	3	x			45	5	0	20		105		1050294	DIT
2	1050411	Artificial Intelligence System Development	4	3	x			39	0	0	42		105		1050292 1050294 1050296	DIT
Select 3 out of the following 5 courses (9 credits)																
3	1050313	Computer Vision	3	3		x		30	0	0	30		75			DIT

No	Course Code	Course	Number of credits	Knowledge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Required	Restricted Elective	Free Elective	Theory	Practice	Tests	Experimental / Practical	Others	Self-study time	Prerequisite	Recommended Prior Course	
4	1050403	Large Language Models and Applications	3	3		x		30	0	0	30		75			DIT
5	1050316	Time Series Forecasting	3	3		x		33	12	0	0		90		1010126	DIT
6	1050283	Data Mining	3	3		x		25	5	0	30		75		1050029	DIT
7	1050298	Big Data Analytics	3	3		x		30	0	0	30		75		1050283	DIT
	Semester 8															
1	1050138	Graduation Internship	3	5	x			2	0	0	86	TT	90		Tất cả các HP kỳ 1-7	DIT
2	1050332	Graduation Thesis	6	5		x						KL				DIT
	<i>Alternative courses</i>															
3	1050115	Contemporary Issues in Information Technology	2	5		x		20	0	20	0		50		1050112 1050041 1050043	DIT
	Software Engineering specialization															
4	1050406	Contemporary Issues in Software Engineering	2	5		x		30	0	0	0		60			DIT
5	1050412	Intelligent Software Development	2	5		x		21	9	0	0		60			DIT

No	Course Code	Course	Num ber of cred its	Knowl edge Area	Course Type			Class duration						Course Prerequisites		Department in charge
					Requi red	Restri cted Electi ve	Free Electi ve	Theor y	Pra ctis e	Tests	Ex per ime ntal / Pra tica l	Othe rs	Self - stu dy tim e c	Prerequ isite	Recomm ended Prior Course	
	Information Systems specialization															
6	1050319	Modern Information Systems	2	5		x		21	0	18	0		60			DIT
7	1050320	Contemporary Issues in Data Science	2	5		x		30	0	0	0		60			DIT
	Cybersecurity and Computer Network Security															
8	1050405	Contemporary Issues in Network Security and Safety	2	5		x		30	0	0	0		60			DIT
9	1050401	Modern Computer Networks and Data Communication	2	5		x		30	0	0	0		60			DIT
	Computer Science specialization															
10	1050398	Generative AI and Applications	2	5		x		15	0	0	30		60			DIT
11	1050395	Open Artificial Intelligence Systems	2	5		x		30	0	0	0		60			DIT
		Total	135													

Note: Symbols used for the curriculum components (knowledge blocks):

1. **General Education**
2. **Disciplinary Foundations and Major Foundations**
3. **Major / Specialization**
4. **Supplementary Courses**
5. **Graduation Requirements** (Graduation Internship / Capstone Project / Graduation Thesis / Alternative courses to the Graduation Thesis)

10. GUIDELINES FOR PROGRAM IMPLEMENTATION

- This training program is applied to students enrolled in the Information Technology major starting from the 2025 admission cycle.
- The training process is implemented based on a designed curriculum, clearly defined training objectives, target learners, human resource requirements, and specific educational requirements. For elective courses, depending on development trends and societal demands, the Department will advise students in selecting appropriate courses.
- The Dean of the Department is responsible for organizing and guiding the principles for developing detailed course syllabi to ensure that the program objectives, contents, and requirements are fully met, while also satisfying the needs of learners and society.
- The training program is reviewed and updated at least once every five years to ensure alignment with developments in the field of Information Technology and the socio-economic development needs.

Gia Lai, August 1, 2025

DEAN OF DEPARTMENT

**HEAD OF TRAINING
OFFICE**

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

Dr. Le Xuan Viet

Dr. Le Xuan Vinh

Dr. Dinh Anh Tuan

