MINISTRY OF EDUCATION AND TRAINING

NAM CAN THO UNIVERSITY

SOCIALIST REPUBLIC OF VIET NAM

Independence – Freedom - Happiness

UNDERGRADUATE PROGRAM

(Issued together with Decision No. /QĐ-ĐHNCT dated / /2025 of The Rector of Nam Can Tho University)

Name of program: Bachelor of Engineering in Artificial Intelligence

Level: Full-time university

Major: Computer Science

Code: 7480107

Type of education: Full-time

1. Program description

1.1. Introduction to the program

1.2. General information about the program

Name of program in Vietnamese	Trí tuệ nhân tạo
Name of program in English	Artificial Intelligence
Program code	7480101
Degree-granting institution	Nam Can Tho University
Degree	Engineering in Artificial Intelligence
Level	University
The number of required credits	**150**
Type of education	Regular
Program duration	4 years
Eligible candidates for admission	High school graduates
Grading scale	10
Graduation requirements	- Accumulate sufficient courses and complete the program requirements with 150 credits; - Cumulative GPA of the entire course is 5.0 or higher; - Meet the output standards of English proficiency according to the general regulations of the School;

	- Meet output standards of Soft Skills and Professional Skills; - Obtain certificates in National Defense - Security Education and Physical Education
Job opportunities	- IT staff in organizations and businesses; - (Programmer, database manager, information system; - Artificial Intelligence application specialists in enterprises, organizations, agencies, and departments
Postgraduate study options	Can continue to study for master's and doctorate degrees in VietNam and internationally
Reference program	Overseas training program; Training program of Can Tho University
Update time	04/2025

1.3. Program goals

1.3.1. General goals

PO: Training engineers with specialized knowledge and skills in information technology, soft skills, self-study ability, foreign language ability, thinking ability, autonomy and responsibility, teamwork ability and the ability to start a business and be creative in work, meeting social requirements for information technology globally.

1.3.2. Specific goals

- **PO1:** Learners understand and apply basic and specialized knowledge of the AI field to professional work, forming specialized ideas in AI.
- **PO2:** Learners meet the requirements of professional skills, soft skills, working and research environment, organize and perform professional AI operations, thereby developing creativity and entrepreneurial ability, developing management capacity, environmental management, and working personnel
- **PO3:** Forming the ability to self-study and research in specialized fields, thus developing related life skills and guiding others, contributing to the improvement of society.

1.4. Student learning outcomes

a. Knowledge

- **SO1:** Apply basic knowledge of political science, law and defense education to cultivate political ethics, professional ethics, practice the sense of national defense and civic responsibility.

- **SO2:** Apply mathematical knowledge, industry basis and specialization to solve practical problems in the AI field.
- **SO3:** Apply teamwork knowledge and evaluate work efficiency in the Computer Science environment, develop a diverse working environment and develop leadership thinking.

b. Skills

- **SO4:** Use English in communication and AI expertise according to the output standards of the Ministry of Education and Training.
- **SO5:** Apply methods for the analysis, design, and operation of AI systems.
- **SO6:** Apply new technologies, especially artificial intelligence and digital transformation to improve work performance.
- **SO7:** Analyze Computer Science problems using critical and creative thinking, demonstrating independence, teamwork in AI projects, and entrepreneurial skills.

c. Capacity for autonomy and responsibility

- **SO8:** Adhere to professional ethics and fulfill social responsibilities in the AI field.
- **SO9:** Engage in lifelong learning, stay up-to-date with new technology trends, and share knowledge.

1.5 Teaching and learning methods/strategies and assessment methods

1.5.1. Teaching and learning methods/strategies

The teaching methods are presented in the table below

Methods and form of teaching organization	Purpose
Presentation	- Provide information and new concepts in a systematic and focused manner. - Help learners grasp core content quickly. - Guide learners through clear presentation logic. - Emphasize the focus and connection between issues. - Convey a large amount of information to many people. - Lay the foundation for subsequent discussion and practice).
Discussion	- Create a positive learning environment, enabling learners to actively exchange ideas. - Develop critical thinking, practice logical reasoning skills. - Practice soft skills: Teamwork, communication, listening and responding, confidently presenting ideas in front of a crowd.

	- Assess the level of understanding).
Assignment	- Help students apply theory to practice, develop problem- solving skills and develop analytical and computational skills. - Teachers detect gaps in students' knowledge to promptly adjust and supplement. - Train self-awareness and discipline, prepare for independent learning and lifelong learning).
Self-study, reading of reference materials	- Expand and deepen knowledge, helping learners access multi-dimensional information, beyond the scope of basic curriculum. - Develop ability for independent learning, develop proactive skills in searching, selecting, and processing information, forming lifelong learning ability - Enhance critical thinking, as a basis for group discussion, report writing or problem solving).

1.5.2. Grading scale, form, assessment criteria, and weight of scores

No.	Form	%	Assessment criteria	Maximum score
1	Attendance	10	Proactivity, level of active preparation for lessons and participation in activities during class. Number of required class attendance	10
2	Individual assignment	15	Percentage of homework completed and correct.	10
3	Progress assessment	15	According to the answers and grading scale of the test, apply the test forms according to the characteristics of each subject (Essay, multiple choice, oral, thematic report,...).	10
4	Final exam	60	According to the answers and grading scale of the exam, apply the exam forms according to the characteristics of each subject (Essay, multiple choice, oral, thematic report,...).	10

2. Program duration: 4 years

3. Required total credits

Required total credits: 151 credits (excluding the Physical Education and Defense and security education courses), distributed as follows:

Knowledge	Obligatory knowledge	Elective knowledge	Total
General knowledge	**40**	**2**	**42**
Professional knowledge	**80**	**28**	**108**
- Fundamental knowledge	40	0	40
- Specialized knowledge	36	22	58
- Graduation internship	4	0	4
- Graduation thesis/Alternative courses	0	6	6
Total	**120**	**30**	**149**

4. Eligible candidates for admission

Admission is based on the results of the national high school graduation exam or the transcript of high school studies according to the combination of subjects by major and nationwide admission

5. Curriculum, graduation requirements

5.1. Curriculum

Implement the regulations for regular university and college training according to the credit system and current training regulations of Nam Can Tho University

5.2. Graduation requirements

- Students who complete the training program will be considered for graduation and recognized as graduating according to Article 27 of the training regulations according to the credit system.

- Achieve English proficiency according to the general regulations of the School

- Obtained certificates in National Defense-Security Education; Physical Education; Soft Skills and Vocational Skills.

- Evaluation of component scores and course scores is carried out according to Articles 22 and 23 of the training regulations according to the credit system

- Academic year ranking and graduation ranking are carried out according to Articles 14 and 28 of the training regulations according to the credit system

6. Program structure

6.1. General knowledge

No.	Course code	Course name	Number of credits	Theory	Practice	Category
A	**Political theory**					
1.		**Marxist-Leninist philosophy**	3	3		Required
2.		Marxist-Leninist political economy	2	2		Required
3.		Scientific socialism	2	2		Required
4.		Ho Chi Minh Thought	2	2		Required
5.		History of the Communist Party of Vietnam	2	2		Required
B	**Social Sciences and Humanities**					
6.		General law	2	2		Required
7.		Digital Transformation	2	2		Required
	Elective course		2	2		Elective
8.		Generative Artificial Intelligence Application **	2	2		Elective
9.		General Sociology	2	2		Elective
10.		Management information system	2	2		Elective
11.		Vietnamese cultural foundation	2	2		Elective
12.		Principles of Accounting	3	3		Elective
C	**Foreign languages**					
13.		Basic English 1	3	3		
14.		Basic English 2	3	3		
15.		Basic English 3	3	3		
16.		Basic English 4	3	3		
17.		English for Computer Science	3	3		
D	**Mathematics - Information Technology - Natural Sciences**					
18.		Advanced Math 1	3	3		Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
19.		Basic Computer Science	3	2	1	Required
20.		Statistical Probability	3	3		Required
21.		Introduction to Computers and Information Technology	1	1		Required
E	**Physical education**					
22.		Physical Education 1(*)	1		1	Elective
23.		Physical Education 2 (*)	1		1	Elective
24.		Physical Education 3 (*)	1		1	Elective
F	**National Defense Education**					
25.		National defense and security education(*)	8		8	

(*)Prerequisite courses, not included in the cumulative GPA calculation

6.2. Professional knowledge

No.	Course code	Course name	Number of credits	Theory	Practice	Category
Fundamental knowledge						
26.		Basic programming	2	2	0	Required
27.		Basic Programming – Practice	2	0	2	Required
28.		Discrete Mathematics 1	3	3	0	Required
29.		Discrete Mathematics 2	3	3	0	Required
30.		Data structure	3	3	0	Required
31.		Data Structures – Practice	1	0	1	Required
32.		Algorithm analysis and design	2	2	0	Required
33.		Algorithm Analysis and Design – Practice	1	0	1	Required
34.		Database	2	2	0	Required
35.		Databases – Practice	1	0	1	Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
36.		Computer network	2	2	0	Required
37.		Computer network – Practice	1	0	1	Required
38.		Operating system principles	2	2	0	Required
39.		Operating System Principles – Practice	1	0	1	Required
40.		Computer architecture	3	3	0	Required
41.		Object Oriented Programming	2	2	0	Required
42.		Object Oriented Programming – Practice	2	0	2	Required
43.		Artificial Intelligence	3	3	0	Required
44.		Research methods and writing scientific reports	2	2	0	Required
45.		Law on IT	2	2	0	Required
Specialized knowledge						
46.		Data Mining	2	2	0	Required
47.		Data Mining – Practice	1	0	1	Required
48.		Computer Vision	2	2	0	Required
49.		Computer Vision - Practice	1	0	1	Required
50.		Decision Support Systems	2	2	0	Required
51.		Decision Support Systems - Practice	1	0	1	Required
52.		Principles of Machine Learning	2	2	0	Required
53.		Principles of Machine Learning – Practice	1	0	1	Required
54.		Python Programming	2	2	0	Required
55.		Python Programming – Practice	1	0	1	Required
56.		Data Visualization	2	2	0	Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
57.		Data Visualization – Practice	1	0	1	Required
58.		Recommender Systems	2	2	0	Required
59.		Recommender Systems – Practice	1	0	1	Required
60.		Natural Language Processing	2	2	0	Required
61.		Natural Language Processing – Practice	1	0	1	Required
62.		Deep Learning	2	2	0	Required
63.		Deep Learning – Practice	1	0	1	Required
64.		Entrepreneurship with Artificial Intelligence	2	2	0	Required
65.		Project 1	3	0	3	Required
66.		Project 2	3	0	3	Required
67.		Practical Training	1	0	1	Required
Elective course of specialized knowledge 1						
68.		Mobile device programming**	2	2	0	Elective
69.		Mobile Programming – Practice **	1	0	1	Elective
70.		Web Programming **	2	2	0	Elective
71.		Web Programming – Practice **	1	0	1	Elective
72.		IoT Technology **	2	2	0	Elective
73.		IoT Technology – Practice**	1	0	1	Elective
74.		Image processing **	2	2		Elective
75.		Image Processing – Practice **	1	0	1	Elective
76.		Cloud computing **	2	2	0	Elective

No.	Course code	Course name	Number of credits	Theory	Practice	Category
77.		Cloud Computing – Practice **	1	0	1	Elective
78.		Information security and safety **	2	2	0	Elective
79.		Artificial Intelligence in Business **	2	2	0	Elective
80.		Data Science **	2	2	0	Elective
81.		Data Science – Practice**	1	0	1	Elective
82.		Ethics in Artificial Intelligence	1	0	1	Elective
83.		Multimedia Data	2	2	0	Elective
84.		.NET Programming	2	2	0	Elective
85.		NET Programming – Practice	1	0	1	Elective
86.		Speech and Audio Processing	2	2	0	Elective
87.		Speech and Audio Processing – Practice	1	0	1	Elective
88.		Data Processing	2	2	0	Elective
89.		Data Processing – Practice	1	0	1	Elective
90.		Information technology project management	2	2	0	Elective
91.		Information Technology Project Management – Practice	1	0	1	Elective
92.		Computer Network Administration	2	2	0	Elective
93.		Computer Network Administration – Practice	2	0	2	Elective
94.		Database management system	2	2	0	Elective

No.	Course code	Course name	Number of credits	Theory	Practice	Category
95.		Database Management Systems – Practice	1	0	1	Elective
96.		Knowledge Base	2	2	0	Elective
97.		Knowledge Base – Practice	1	0	1	Elective
Graduation internship						
98.		Final Internship IT	4	0	4	Required
Graduation thesis/Alternative courses						
99.		Graduation thesis IT	6	0	6	Elective
Alternative courses						
100.		Artificial Intelligence in Agriculture	2	2	0	Elective
101.		Artificial Intelligence in Agriculture – Practice	1	0	1	Elective
102.		Blockchain Technology	2	2	0	Elective
103.		Blockchain Technology – Practice	1	0	1	Elective

7. Tentative teaching plan

7.1. Semester 1

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Basic English 1	3	45	45	0	Required
2	(*) (Physical Education 1	1	30	0	30	Required
3	Marxist-Leninist philosophy	3	45	45	0	Required
4	Basic Computer Science	2	30	30	0	Required
5	Advanced Math 1	3	45	45	0	Required
6	Discrete Mathematics 1	3	45	45	0	Required
7	Introduction to Computers and	1	15	15	0	Required

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
	Information Technology					
8	General law	2	30	30	0	Required
	Total	**18**				

Note: Courses marked with ** are currently selected for the current course

7.2. Semester 2

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Marxist-Leninist political economy	2	30	30	0	Required
2	Scientific socialism	2	30	30	0	Required
3	(*) Physical Education 2	1	30	0	30	Elective
4	(*) National defense and security education	8	165	0	165	Required
5	Basic English 2	3	45	45	0	Required
6	Discrete Mathematics 2	3	45	45	0	Required
7	Basic programming	2	30	30	0	Required
8	Basic programming - Practice	2	60	0	60	Required
9	Computer architecture	3	45	45	0	Required
	Total	**17**				
	Elective courses	**2**				
10	Digital Transformation	2	30	30	0	Elective
11	Vietnamese cultural foundation	2	30	30	0	Elective
	Total	**19**				

7.3. Semester 3

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
1	History of the Communist Party of Vietnam	2	30	30	0	Required
2	Basic English 3	3	45	45	0	Required
3	(*) Physical Education 3	1	30	0	30	Elective
4	Statistical Probability	3	45	45	0	Required
5	Data structure	3	45	45	0	Required
6	Data Structures – Practice	1	30	0	30	Required
7	Operating system principles	2	30	30	0	Required
8	Operating System Principles – Practice	1	30	0	30	Required
9	Object Oriented Programming	2	30	30	0	Required
10	Object Oriented Programming – Practice	2	60	0	60	Required
	Total	**19**				

7.4. Semester 4

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Ho Chi Minh Thought	2	30	30	0	Required
2	Artificial Intelligence	3	45	45	0	Required
3	Algorithm analysis and design	2	30	30	0	Required
4	Algorithm Analysis and Design – Practice	1	30	0	30	Required
5	Database	2	2	2	0	Required
6	Databases – Practice	1	1	0	1	Required
7	Python Programming	2	30	30	0	Required

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
8	Python Programming – Practice	1	30	0	30	Required
9	Basic English 4	3	45	45	0	Required
10	Computer network	2	30	30	0	Required
11	Computer network – Practice	1	30	0	30	Required
	Total	**20**				

7.5. Semester 5

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Data Visualization	2	30	30	0	Required
2	Data Visualization – Practice	1	30	0	30	Required
3	English for AI	3	45	45	0	Required
4	Machine Learning	2	30	30	0	Required
5	Machine Learning – Practice	1	30	0	30	Required
	Total	**9**				
	Elective courses	**11**				
6	Mobile device programming	2	30	30	0	Elective
7	Mobile Programming – Practice	1	30	0	30	Elective
8	Web Programming	2	30	30	0	Elective
9	Web Programming – Practice	2	60	0	60	Elective
10	.NET Programming	2	30	30	0	Elective
11	NET Programming – Practice	2	60	0	60	Elective
12	Management information system **	2	30	30	0	Elective

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
13	Generative Artificial Intelligence Application	2	45	15	30	Elective
14	Principles of Accounting	3	45	45	0	Elective
15	General Sociology	2	30	30	0	Elective
	Total	**20**				

7.6. Semester 6

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Law on IT	2	30	30	0	Required
2	Deep Learning	2	30	30	0	Required
3	Deep Learning – Practice	1	30	0	30	Required
4	Decision Support Systems	2	30	30	0	Required
5	Decision Support Systems - Practice	1	30	0	30	Required
6	Data Mining	2	30	30	0	Required
7	Data Mining – Practice	1	30	0	30	Required
8	Project 1	3	90	0	90	Required
	Total	**14**				
	Elective courses	**6**				
9	Cloud computing	2	30	30	0	Elective
10	Cloud Computing – Practice	1	30	0	30	Elective
11	Image processing	2	30	30	0	Elective
12	Image Processing – Practice	1	30	0	30	Elective
13	Speech and Audio Processing	2	30	30	0	Elective
14	Speech and Audio Processing – Practice	1	30	0	30	Elective

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
15	Data Processing	2	30	30	0	Elective
16	Data Processing – Practice	1	30	0	30	Elective
	Total	**20**				

7.7. Semester 7

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Recommender Systems	2	30	30	0	Required
2	Recommender Systems – Practice	1	30	0	30	Required
3	Computer Vision	2	30	30	0	Required
4	Computer Vision - Practice	1	30	0	30	Required
5	Natural Language Processing	2	30	30	0	Required
6	Natural Language Processing – Practice	1	30	0	30	Required
7	Entrepreneurship with Artificial Intelligence	2	30	30	0	Required
8	Project 2	3	90	0	90	Required
	Total	**14**				
	Elective courses	**6**				
9	IoT Technology	2	30	30	0	Elective
10	IoT Technology – Practice	1	30	0	30	Elective
11	Data Science	2	30	30	0	Elective
12	Data Science – Practice	1	30	0	30	Elective
13	Information technology project management	2	30	30	0	Elective

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
14	Information Technology Project Management – Practice	1	30	0	30	Elective
15	Computer Network Administration	2	30	30	0	Elective
16	Computer Network Administration – Practice	2	60	0	60	Elective
17	Database management system	2	30	30	0	Elective
18	Database Management Systems – Practice	1	30	0	30	Elective
	Total	**20**				

7.8. Semester 8

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Required Courses					
1	Research methods and writing scientific reports	2	45	15	30	Required
2	Final Internship	4	120	0	120	Required
	Total	**6**				
	Elective courses	**3**				
3	Information security and safety	2	30	30	0	Elective
4	Multimedia Data	2	30	30	0	Elective
5	Ethics in Artificial Intelligence	2	30	30	0	Elective
6	Artificial Intelligence in Business	1	30	0	30	Elective
	Total	**3**				
	Graduation Thesis	**6**				
7	Graduation Thesis AI	6	180	0	180	Elective

No. No.	Course name Course name	Number of credits Number of credits	Total periods Total periods	Class periods		Category No.
				Class periods	Category	
	Total	**6**				
	Study alternative course for graduation thesis	**6**				
8	Artificial Intelligence in Agriculture	2	30	30	0	Elective
9	Artificial Intelligence in Agriculture – Practice	1	30	0	30	Elective
10	Blockchain Technology**	2	30	30	0	Elective
11	Blockchain Technology – Practice**	1	30	0	30	Elective
	Total	**15**				

(*)If students do not meet the requirements to complete their graduation thesis, they will take alternative courses

8. Guidelines for Program Implementation

8.1 Faculties and departments

- The Faculty of Professional Management is responsible for reviewing and developing detailed course outlines for fundamental, core, and specialized knowledge areas, ensuring the correct credit allocation according to this program. Providing a list of textbooks, lectures and reference materials of all subjects to the School Library and storing them in the Faculty Office. At the beginning of each semester, coordinate with the units of the School to implement the training plan on schedule.

- Assign lecturers with a master's degree or higher (in the same or related field) to teach theoretical courses, provide detailed course outlines to lecturers to ensure compliance with the School's general teaching plan.

- The academic advisor team must thoroughly understand the entire credit-based training program to guide students in registering for courses.

8.2 Lecturers

- When a lecturer is assigned to teach one or more courses, he/she must carefully study the detailed course outline to prepare lectures and appropriate teaching aids and tools.

- Lecturers must fully prepare lectures, textbooks, learning materials and provide them to students to prepare before class.

- Organizing seminars, focusing on organizing group study and guiding students to write essays and projects. Lecturers determine teaching methods; give presentations in class, guide discussions, solve problems in class, in the practice room, in the laboratory and guide students to write reports.

- Pay attention to developing students' self-study and research abilities throughout the teaching and internship and practice process.

- It is necessary to pay attention to the logic of conveying and acquiring knowledge blocks, specifying prerequisite courses of Required courses and preparing lecturers to meet the requirements of teaching elective courses.

8.3 Students

- Must consult with academic advisor to choose courses that are suitable for progress. Must study the lesson before class to easily absorb the lecture. Must ensure enough class time to listen to the lecturer's lecture instructions. Be proactive in self-study and self-research, and actively participate in group study, attend all seminars.

- Proactively and actively exploit resources on the Internet and in the school library to serve self-study, self-research and graduation project. Strictly implement regulations on examination, testing and evaluation.

- Regularly participate in group activities, literature, sports and arts to practice communication skills, understanding of society and people.

8.4 Facilities and equipment for teaching, practice, and internships

- Theoretical classroom system with traditional equipment, equipped with additional teaching aids (projector).

- The computer lab is installed with software for basic computer training, computer graphics applications, computer design applications, and computer simulation applications.

RECTOR	DEPARTMENT OF ACADEMIC AFFAIRS	FACULTY