MINISTRY OF EDUCATION AND TRAINING **SOCIALIST REPUBLIC OF VIETNAM**

NAM CAN THO UNIVERSITY **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 Computer Science**

Level**:** Full-time university

Major**:** Computer Science

Code**:** 7480101

Type of education**:** Full-time

1. Program Description

1.1. Introduction to the Program

The Computer Science program at Nam Can Tho University is designed to train engineers with in-depth knowledge and practical skills in computer science, meeting the demand for high-quality professionals in the Industry 4.0 era.

1.2. General Information about the Program

Name of program	Computer Science
Program code	7480101
Degree-granting institution	Nam Can Tho University
Degree	Bachelor of Engineering in Computer Science
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. - Study must achieve a cumulative is GPA 5.0 or higher

	- Meet the output standards of English proficiency according to the general regulations of the University. - Meet output standards of soft skill 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 specialist. - Specialists in the application of Computer Science in enterprises, organizations, agencies, and departments.
Postgraduate study options	Can continue to study for master's and doctoral degrees in Vietnam and internationally.
Reference program	Overseas training programs; Training program of Can Tho University.
Update time	04/2025

1.3. Program Goals

1.3.1. General Goals

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

1.3.2. Specific Goals

- **PO1**: Learners understand and apply basic and specialized knowledge of the Computer Science field to professional work, forming specialized ideas in Computer Science.
- **PO2**: Learners meet the requirements of professional skills, soft skills, working and research environment, organize and perform professional Computer Science operations, thereby developing creativity, entrepreneurial ability, and management capacity for environments and personnel.
- **PO3**: Form 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 fundamentals, and specialization to solve practical problems in the Computer Science field.

- **SO3**: Apply teamwork knowledge and evaluate work efficiency in the Computer Science environment, develop a diverse working environment, and foster leadership thinking.

b. Skills

- **SO4**: Use English in communication and Computer Science expertise according to the output standards of the Ministry of Education and Training.
- **SO5**: Apply methods for the analysis, design, and operation of Computer Science 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 Computer Science projects, and entrepreneurial skills.

c. Capacity for Autonomy and Responsibility

- **SO8**: Adhere to professional ethics and fulfill social responsibilities in the Computer Science 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

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 Physical Education and National Defense and Security Education courses), distributed as follows:

Knowledge	Obligatory Knowledge	Elective Knowledge	Total
General Knowledge	**40**	**2**	**42**
Professional Knowledge	**96**	**12**	**108**
Fundamental Knowledge	40	0	40
Specialized Knowledge	51	7	58
Graduation Internship	4	0	4
Graduation Thesis/Alternative Courses	0	6	6
Total	**136**	**14**	**150**

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 University.

- Obtain certificates in National Defense - Security Education; Physical Education; Soft Skills and Professional 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	0101000889	Marxist-Leninist Philosophy	3	3		Required
2	0101000896	Marxist-Leninist Political Economy	2	2		Required
3	0101000898	Scientific Socialism	2	2		Required
4	0101000921	Ho Chi Minh Ideology	2	2		Required
5	0101000926	History of the Communist Party of Vietnam	2	2		Required
B	**Social Sciences and Humanities**					
6	0101000641	General Law	2	2		Required
7	0101000919	Digital Transformation	2	2		Required
	Elective Course		2	2		Elective
8	0101000973	Generative Artificial	2	1	1	Elective

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
		Intelligence Application				
9	0101000922	General Sociology	2	2		Elective
10	0101000595	Management Information System	2	2		Elective
11	0101000894	Vietnamese Cultural Foundation	2	2		Elective
12	0101000902	Principles of Accounting	3	3		Elective
C	**Foreign Languages**					
13	0101000861	Basic English 1	3	3		Required
14	0101000862	Basic English 2	3	3		Required
15	0101000863	Basic English 3	3	3		Required
16	0101000864	Basic English 4	3	3		Required
17	0101000960	English for Computer Science	3	3		Required
D	**Mathematics - Information Technology - Natural Sciences**					
18	0101000924	Advanced Mathematics 1	3	3		Required
19	0101000975	Basic Computer Science	3	2	1	Required
20	0101000890	Probability and Statistics	3	3		Required
21	0101000925	Introduction to Computers and Information Technology	1	1		Required
E	**Physical Education**					
22	0101000872	Physical Education 1 (*)	1		1	Elective
23	0101000873	Physical Education 2 (*)	1		1	Elective
24	0101000874	Physical Education 3 (*)	1		1	Elective
F	**National Defense and Security Education**					
25	0101000871	National Defense and Security Education (*)	8		8	Required

(*) 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						

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
26	0101000978	Basic Programming	2	2	0	Required
27	0101000883	Basic Programming – Practice	2	0	2	Required
28	0101000982	Discrete Mathematics 1	3	3	0	Required
29	0101000981	Discrete Mathematics 2	3	3	0	Required
30	0101000983	Data Structures	3	3	0	Required
31	0101000984	Data Structures – Practice	1	0	1	Required
32	0101000979	Algorithm Analysis and Design	2	2	0	Required
33	0101000980	Algorithm Analysis and Design – Practice	1	0	1	Required
34	0101000976	Databases	2	2	0	Required
35	0101000977	Databases – Practice	1	0	1	Required
36	0101000989	Computer Networks	2	2	0	Required
37	0101000881	Computer Networks – Practice	1	0	1	Required
38	0101001784	Operating System Principles	2	2	0	Required
39	0101001786	Operating System Principles – Practice	1	0	1	Required
40	0101001785	Computer Architecture	3	3	0	Required
41	0101001000	Object-Oriented Programming	2	2	0	Required
42	0101001001	Object-Oriented Programming – Practice	2	0	2	Required
43	0101000985	Artificial Intelligence	3	3	0	Required

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
44	0101000986	Research Methods and Scientific Report Writing	2	2	0	Required
45	0101001005	Information Technology Law	2	2	0	Required
Specialized Knowledge						
46	0101000900	Image Processing	2	2	0	Required
47	0101000987	Image Processing – Practice	1	0	1	Required
48	0101000992	Data Mining	2	2	0	Required
49	0101001611	Data Mining – Practice	1	0	1	Required
50	0101001787	Computer Vision	2	2	0	Required
51	0101000990	Computer Vision – Practice	1	0	1	Required
52	0101001350	Cloud Computing	2	2	0	Required
53	0101001351	Cloud Computing – Practice	1	0	1	Required
54	0101002298	Mobile Device Programming	2	2	0	Required
55	0101002299	Mobile Device Programming – Practice	1	0	1	Required
56	0101000993	Principles of Machine Learning	2	2	0	Required
57	0101000994	Principles of Machine Learning – Practice	1	0	1	Required
58	0101001790	Python Programming	2	2	0	Required
59	0101001791	Python Programming – Practice	1	0	1	Required
60	0101000995	IoT Technology	2	2	0	Required
61	0101000996	IoT Technology – Practice	1	0	1	Required
62	0101001613	Recommender Systems	2	2	0	Required
63	0101001614	Recommender Systems – Practice	1	0	1	Required

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
64	0101001077	.NET Programming	2	2	0	Required
65	0101001078	.NET Programming – Practice	1	0	1	Required
66	0101001812	Web Programming	2	2	0	Required
67	0101001817	Web Programming – Practice	1	0	1	Required
68	0101000869	Information Theory	3	3	0	Required
69	0101000991	Data Visualization	2	2	0	Required
70	0101001816	Data Visualization – Practice	1	0	1	Required
71	0101002319	Natural Language Processing	2	2	0	Required
72	0101002320	Natural Language Processing – Practice	1	0	1	Required
73	0101002321	Information Security and Safety	2	2	0	Required
74	0101001813	Project 1	3	0	3	Required
75	0101001814	Project 2	3	0	3	Required
76	0101002296	Practical Training	1	0	1	Required
Elective Courses of Specialized Knowledge						
77	0101002070	Data Science**	2	2	0	Elective
78	0101002071	Data Science – Practice**	1	0	1	Elective
79	0101002322	Deep Learning**	2	2	0	Elective
80	0101002323	Deep Learning – Practice**	1	0	1	Elective
81	0101000615	Ethics in Artificial Intelligence**	1	0	1	Elective
82	0101001810	Artificial Intelligence in Business	2	2	0	Elective
83	0101001821	Multimedia Data	2	2	0	Elective
84	0101001796	Information Systems Analysis and Design	2	2	0	Elective

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
85	0101000645	Information Systems Analysis and Design – Practice	2	0	2	Elective
86	0101000710	E-commerce System	2	2	0	Elective
87	0101002057	E-commerce Systems – Practice	1	0	1	Elective
88	0101002197	Information Technology Project Management	2	2	0	Elective
89	0101002198	Information Technology Project Management – Practice	1	0	1	Elective
90	0101002199	Computer Network Administration	2	2	0	Elective
91	0101002201	Computer Network Administration – Practice	2	0	2	Elective
92	0101002207	Database Management System	2	2	0	Elective
93	0101002208	Database Management Systems – Practice	1	0	1	Elective
Graduation Internship						
94	0101002325	Final IT Internship	4	0	4	Required
Graduation Thesis/Alternative Courses						
95	0101002209	Graduation Thesis (Computer Science)	6	0	6	Elective
Alternative Courses for Graduation Thesis						
96	0101002288	Open Source Software Development	2	2	0	Elective
97	0101000775	Open Source Software	1	0	1	Elective

No.	Course Code	Course Name	Number of Credits	Theory	Practice	Category
		Development – Practice				
98	0101000191	Blockchain Technology	2	2	0	Elective
99	0101000198	Blockchain Technology – Practice	1	0	1	Elective

7. Teaching Plan (Tentative)

7.1. Semester 1

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
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 Mathematics 1	3	45	45	0	Required
6	Discrete Mathematics 1	3	45	45	0	Required
7	Introduction to Computers and Information Technology	1	15	15	0	Required
8	General Law	2	30	30	0	Required
	Total	**18**				

7.2. Semester 2

No.	Course Name	Credits	Total Periods	Theory Periods	Practice 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	General Law	2	30	30	0	Required
	Total	**20**				
	Elective Courses					
10	Digital Transformation	2	30	30	0	Elective
11	Vietnamese Cultural Foundation	2	30	30	0	Elective
	Total	**22**				

7.3. Semester 3

No.	Course Name	Credits	Total Periods	Theory Periods	Practice 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	Probability and Statistics	3	45	45	0	Required
5	Data Structures	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.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
	Required Courses					
1	Ho Chi Minh Ideology	2	30	30	0	Required
2	Information Theory	3	45	45	0	Required

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
3	Algorithm Analysis and Design	2	30	30	0	Required
4	Algorithm Analysis and Design – Practice	1	30	0	30	Required
5	Databases	2	30	30	0	Required
6	Databases – Practice	1	30	0	30	Required
7	Python Programming	2	30	30	0	Required
8	Python Programming – Practice	1	30	0	30	Required
9	Basic English 4	3	45	45	0	Required
	Total	**17**				
	Elective Courses					
10	Generative Artificial Intelligence Application	2	45	15	30	Elective
11	General Sociology	2	30	30	0	Elective
	Total	**19**				

7.5. Semester 5

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
	Required Courses					
1	Mobile Device Programming	2	30	30	0	Required
2	Mobile Device Programming – Practice	1	30	0	30	Required
3	Web Programming	2	30	30	0	Required
4	Web Programming – Practice	2	60	0	60	Required
5	Computer Networks	2	30	30	0	Required
6	Computer Networks – Practice	1	30	0	30	Required
7	Artificial Intelligence	3	45	45	0	Required
8	.NET Programming	2	30	30	0	Required
9	.NET Programming – Practice	2	60	0	60	Required
	Total	**19**				

	Elective Courses					
10	Management Information System**	2	30	30	0	Elective
11	Principles of Accounting	3	45	45	0	Elective
	Total	**19**				

7.6. Semester 6

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
	Required Courses					
1	Cloud Computing	2	30	30	0	Required
2	Cloud Computing – Practice	1	30	0	30	Required
3	Principles of Machine Learning	2	30	30	0	Required
4	Principles of Machine Learning – Practice	1	30	0	30	Required
5	Image Processing	2	30	30	0	Required
6	Image Processing – Practice	1	30	0	30	Required
7	English for Computer Science	3	45	45	0	Required
8	Project 1	3	90	0	90	Required
	Total	**15**				
	Elective Courses					
9	Information Systems Analysis and Design	2	30	30	0	Elective
10	Information Systems Analysis and Design – Practice	2	60	0	60	Elective
11	Computer Network Administration	2	30	30	0	Elective
12	Computer Network Administration – Practice	2	60	0	60	Elective
13	Database Management System	2	30	30	0	Elective
14	Database Management Systems – Practice	1	30	0	30	Elective
	Total	**19**				

7.7. Semester 7

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
	Required Courses					
1	IoT Technology	2	30	30	0	Required
2	IoT Technology – Practice	1	30	0	30	Required
3	Computer Vision	2	30	30	0	Required
4	Computer Vision – Practice	1	30	0	30	Required
5	Data Mining	2	30	30	0	Required
6	Data Mining – Practice	1	30	0	30	Required
7	Information Security and Safety	2	30	30	0	Required
8	Information Technology Law	2	30	30	0	Required
9	Data Visualization	2	30	30	0	Required
10	Data Visualization – Practice	1	30	0	30	Required
11	Project 2	3	90	0	90	Required
	Total	**17**				
	Elective Courses					
12	Information Technology Project Management	2	30	30	0	Elective
13	Information Technology Project Management – Practice	1	30	0	30	Elective
14	E-commerce System	2	30	30	0	Elective
15	E-commerce Systems – Practice	1	30	0	30	Elective
	Total	**19**				

7.8. Semester 8

No.	Course Name	Credits	Total Periods	Theory Periods	Practice Periods	Category
	Required Courses					
1	Research Methods and Scientific Report Writing	2	45	15	30	Required
2	Natural Language Processing	2	30	30	0	Required
3	Natural Language Processing – Practice	1	30	0	30	Required

4	Recommender Systems	2	30	30	0	Required
5	Recommender Systems – Practice	1	30	0	30	Required
6	Final Internship	4	120	0	120	Required
	Total	**12**				
	Elective Courses					
7	Graduation Thesis (Computer Science)	6	180	0	180	Elective
	Alternative Courses for Graduation Thesis					
8	Open Source Software Development	2	30	30	0	Elective
9	Open Source Software Development – Practice	1	30	0	30	Elective
10	Blockchain Technology**	2	30	30	0	Elective
11	Blockchain Technology – Practice**	1	30	0	30	Elective
	Total	**18**				

Note: Courses marked with ** are selected for the current cohort. If students do not meet the requirements for the graduation thesis, they will take alternative courses.

8. Guidelines for Program Implementation

8.1. For Faculties and Departments

- The Faculty responsible for academic management shall review and lead the development of detailed syllabi for courses in the foundational, major, and specialized knowledge blocks in accordance with the credit allocation of this program. Provide a list of textbooks, lecture notes, and reference materials for all courses to the University Library and keep them at the Faculty Office. At the beginning of each semester, coordinate with relevant University units 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 syllabi to lecturers to ensure compliance with the University's general teaching plan.

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

8.2. For Lecturers

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

- Lecturers must prepare comprehensive lecture notes, textbooks, and learning materials and provide them to students for preparation before class.

- Organize seminars, emphasize group learning, and guide students in writing essays and projects. Lecturers determine teaching methods: classroom presentations, guiding discussions, resolving issues in class, in practice rooms, in laboratories, and guiding students in writing reports.

- Focus on developing students' self-study and research abilities throughout the teaching and practical guidance process.

- Pay attention to the logical delivery and acquisition of knowledge blocks, specify prerequisite courses for required courses, and prepare lecturers to meet the teaching requirements for elective courses.

8.3. For Students

- Students must consult with academic advisors to select courses suitable for their progress. They must study the material before class to better absorb the lectures. Ensure sufficient class attendance to follow the lecturer's guidance. Be proactive in self-study and research, actively participate in group learning, and attend all seminars.

- Actively and proactively utilize online resources and the University library to support self-study, research, and graduation projects. Strictly adhere to examination, testing, and assessment regulations.

- Regularly participate in extracurricular, cultural, sports, and arts activities to develop communication skills and gain social and human understanding.

8.4. Facilities and Equipment for Teaching, Practice, and Internship

- A system of theoretical classrooms with traditional equipment, additionally equipped with teaching support tools (projectors).

- Computer practice rooms installed with software to support basic IT training, applied graphics IT, applied design IT, and IT for simulating processes.

RECTOR	DEPARTMENT OF ACADEMIC AFFAIRS	FACULTY