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 Software Engineering**

Level : **Full-time university**

Major : **Software Engineering**

Code : **7480103**

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	Kỹ Thuật Phần Mềm
Name of program in English	Software Engineering
Program code	7480103
Degree-granting institution	Nam Can Tho University
Degree	Bachelor of Engineering in Software Engineering
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	- Software engineer with roles: analyst, programmer, tester, maintainer, programming team leader, project leader in software companies, consulting companies - designing information technology (IT) solutions for businesses, IT operation and development departments of agencies and organizations - Software production business owner - IT application specialists in enterprises, organizations, agencies, and departments - IT lecturer at colleges, high schools, vocational schools and vocational training schools
Postgraduate study options	Meet the learning requirements at postgraduate levels in the field of Software Engineering
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 Software Engineering, 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 Software Engineering to professional work, forming specialized ideas in IT.
- **PO2:** Learners meet the requirements of professional skills, soft skills, working and research environment, organize and perform professional software engineering 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 IT field.
- **SO3:** Apply software engineering knowledge to evaluate work performance in an IT environment, develop a diverse work environment and develop leadership thinking.

b. Skills

- **SO4:** Use English in communication and software engineering according to the output standards of the Ministry of Education and Training.
- **SO5:** Apply methods of analysis, design and implementation of IT system operating software.
- **SO6:** *Apply new technologies, especially artificial intelligence and digital transformation to improve work performance.*
- **SO7:** *Analyze IT problems using critical and creative thinking, demonstrating independence, teamwork in IT projects, and entrepreneurial skills.*

c. Capacity for autonomy and responsibility

- **SO8:** Adhere to professional ethics and fulfill social responsibilities in the IT 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.

Methods and form of teaching organization	Purpose
	- 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

No.	Form	%	Assessment criteria	Maximum score
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: 150 credits (excluding the Physical Education and Defense and security education courses), distributed as follows:

Knowledge	Obligatory knowledge	Elective knowledge	Total
General knowledge	**40**	**4**	**44**
Professional knowledge	**94**	**12**	**106**
- Fundamental knowledge	46	0	46
- Specialized knowledge	44	6	50
- Graduation internship	*4*	*0*	*4*
- Graduation thesis/Alternative courses	*0*	*6*	*6*
Total	**134**	**16**	**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.

- 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.		General Psychology	2	2		Required
	Elective course		4	4		Elective
8.		Management information system **	2	2		Elective
9.		General Sociology	2	2		Elective
10.		General Logic**	2	2		Elective

No.	Course code	Course name	Number of credits	Theory	Practice	Category
11.		Vietnamese cultural foundation	2	2		Elective
C	**Foreign languages**					
12.		Basic English 1	3	3		Required
13.		Basic English 2	3	3		Required
14.		Basic English 3	3	3		Required
15.		Basic English 4	3	3		Required
16.		English for IT	3	3		Required
D	**Mathematics - Information Technology - Natural Sciences**					
17.		Advanced Math 1	3	3		Required
18.		Basic Computer Science	3	2	1	Required
19.		Statistical Probability	3	3		Required
20.		Introduction to Computers and Information Technology	1	1		Required
E	**Physical education**					
21.		Physical Education 1	1		1	Elective
22.		Physical Education 2	1		1	Elective
23.		Physical Education 3	1		1	Elective
F	**National Defense Education**					
24.		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						
25.		Basic programming	2	2	0	Required
26.		Basic Programming – Practice	2	0	2	Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
27.		Discrete Mathematics 1	3	3	0	Required
28.		Discrete Mathematics 2	3	3	0	Required
29.		Data structure	3	3	0	Required
30.		Data Structures – Practice	1	0	1	Required
31.		Algorithm analysis and design	2	2	0	Required
32.		Algorithm Analysis and Design – Practice	1	0	1	Required
33.		Database	2	2	0	Required
34.		Databases – Practice	1	0	1	Required
35.		Computer network	2	2	0	Required
36.		Computer network – Practice	1	0	1	Required
37.		Operating system principles	2	2	0	Required
38.		Operating System Principles – Practice	1	0	1	Required
39.		Computer architecture	3	3	0	Required
40.		Object Oriented Programming	2	2	0	Required
41.		Object Oriented Programming – Practice	2	0	2	Required
42.		Artificial Intelligence	3	3	0	Required
43.		Research methods and writing scientific reports	2	2	0	Required
44.		Introduction to software engineering	2	2	0	Required
45.		Law on IT	2	2	0	Required
46.		Multimedia data	2	2	0	Required
47.		Digital Transformation	2	2		Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
48.		Generative Artificial Intelligence Application	2	1	1	Required
Specialized knowledge						
49.		Software requirements analysis	3	3	0	Required
50.		Software design	2	2	0	Required
51.		Software design-Practice	1	0	1	Required
52.		Software testing	2	2	0	Required
53.		Software Testing – Practice	1	0	1	Required
54.		Software quality assurance	2	2	0	Required
55.		Software maintenance	2	2	0	Required
56.		Python Programming	2	2	0	Required
57.		Python Programming – Practice	1	0	1	Required
58.		Information systems analysis and design	2	2	0	Required
59.		Thực hành Information Systems Analysis and Design – Practice	2	0	2	Required
60.		.NET Programming	2	2	0	Required
61.		.NET Programming – Practice	2	0	2	Required
62.		Web Programming	2	2	0	Required
63.		Web Programming – Practice	2	0	2	Required
64.		E-commerce system	2	2	0	Required
65.		E-commerce Systems – Practice	1	0	1	Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
66.		UML modeling language	2	2	0	Required
67.		UML Modeling Language – Practice	1	0	1	Required
68.		Information technology project management	2	2	0	Required
69.		Information Technology Project Management – Practice	1	0	1	Required
70.		Project 1	3	0	3	Required
71.		Project 2	3	0	3	Required
72.		Practical internship	1	0	1	Required
Choose one of two directions						
* Cloud Computing Specialization						
73.		Open source software development	2	2	0	Elective
74.		Open source software development – Practice	1	0	1	Elective
75.		Cloud computing	2	2	0	Elective
76.		Cloud Computing – Practice	1	0	1	Elective
* Specialization in Embedded and Mobile Systems						
77.		IoT technology	2	2	0	Elective
78.		IoT technology - Practice	1	0	1	Elective
79.		Mobile device programming	2	2	0	Elective
80.		Mobile Programming – Practice	1	0	1	Elective
Graduation internship						
81.		Final Internship IT	4	0	4	Required
Graduation thesis/Alternative courses						
82.		Graduation thesis IT	6	0	6	Elective
Alternative courses						

No.	Course code	Course name	Number of credits	Theory	Practice	Category
83.		Blockchain Technology	2	2	0	Elective
84.		Blockchain Technology – Practice	1	0	1	Elective
85.		WPF Programming	2	2	0	Elective
86.		WPF Programming - Practice	1	0	1	Elective
87.		Development of Management Information Systems	2	2	0	Elective
88.		Development of Management Information Systems - Practice	1	1	0	Elective

7. Tentative teaching plan

7.1. Semester 1

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
	(Required Courses					
1	Basic English 1	3	45	45	0	Required
2	(*) Physical Education 1	1	30	0	30	Required
3	Basic Computer Science	2	30	30	0	Required
4	Basic Computer Science - Practice	1	30	0	30	Required
5	Advanced Math 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	**16**				
	Elective courses	**2**				
9	General Logic**	2	30	30	0	Elective
10	General Sociology	2	30	30	0	Elective

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
11	Vietnamese cultural foundation	2	30	30	0	Elective
	Total	**18**				

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

7.2. Semester 2

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
1	Basic English 2	3	45	45	0	Required
2	Physical Education 2	1	30	0	30	Required
3	National defense and security education *	8	165	0	165	Required
4	General Psychology	2	30	30	0	Required
5	Basic programming	2	30	30	0	Required
6	Basic programming - Practice	2	60	0	60	Required
7	Discrete Mathematics 2	3	45	45	0	Required
	Total	**21**				

7.3. Semester 3

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
1	Basic English 3	3	45	45	0	Required
2	(*) Physical Education 3	1	30	0	30	Elective
3	Marxist-Leninist philosophy	3	45	45	0	Required
4	Marxist-Leninist political economy	2	30	30	0	Required
5	Data structure	3	45	45	0	Required
6	Data Structures – Practic	1	30	0	30	Required
7	Database	2	2	2	0	Required
8	Databases – Practice	1	1	0	1	Required
9	Object Oriented Programming	2	30	30	0	Required
10	Object Oriented Programming – Practice	2	60	0	60	Required
	Total	**20**				

7.4. Semester 4

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
1	Basic English 4	3	45	45	0	Required
2	Computer architecture	3	45	45	0	Required
3	Scientific socialism	2	30	30	0	Required
4	Statistical Probability	3	45	45	0	Required
5	Computer network	2	30	30	0	Required
6	Computer network – Practice	1	30	0	30	Required
7	Algorithm analysis and design	2	30	30	0	Required
8	Algorithm Analysis and Design – Practice	1	30	0	30	Required
9	Web Programming	2	30	30	0	Required
10	Web Programming – Practice	2	60	0	60	Required
	Total	**21**				

7.5. Semester 5

No.	*Course name*	*Number of credits*	*Total periods*	*Class periods*		*Category*
				Theory	*Practice*	
1	Digital Transformation	2	30	30	0	Required
2	Generative Artificial Intelligence Application	2	45	15	30	Required
3	Ho Chi Minh Thought	2	30	30	0	Required
4	English for IT	3	45	45	0	Required
5	Information systems analysis and design	2	30	30	0	Required
6	Information Systems Analysis and Design – Practice	2	60	0	60	Required
7	Introduction to software engineering	2	30	30	0	Required
8	.NET Programming	2	30	30	0	Required
9	.NET Programming – Practice	2	60	0	60	Required
10	Operating system principles	2	30	30	0	Required
11	Operating System Principles – Practice	1	30	0	30	Required
	Total	**22**				

7.6. Semester 6

No.	**Course name**	**Number of credits**	**Total periods**	**Class periods**		**Category**
				Theory	**Practice**	
1	History of the Communist Party of Vietnam	2	30	30	0	Required
2	Software quality assurance	2	30	30	0	Required
3	UML modeling language	2	30	30	0	Required
4	UML Modeling Language – Practice	1	30	0	30	Required
5	Artificial Intelligence	3	45	45	0	Required
6	Law on IT	2	30	30	0	Required
7	Software requirements analysis	3	45	45	0	Required
8	Project 1	3	90	0	90	Required

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
9	Practical internship	1	30	0	30	Required
	Total	**19**				
	Elective courses	**3**				
	Cloud Computing Specialization					
10	Open source software development	2	30	30	0	Elective
11	Open source software development – Practice	1	30	0	30	Elective
	Specialization in Embedded and Mobile Systems					
12	IoT technology	2	30	30	0	Elective
13	IoT technology - Practice)	1	30	0	30	Elective
	Total	**22**				

7.7. Semester 7

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
	Học phần bắt buộc (Required Courses)					
1	Software maintenance	2	30	30	0	Required
2	Python Programming	2	30	30	0	Required
3	Python Programming – Practice	1	30	0	30	Required
4	Software design	2	30	30	0	Required
5	Software design- Practice	1	30	0	30	Required
6	E-commerce system	2	30	30	0	Required
7	E-commerce Systems – Practice	1	30	0	30	Required
8	Project 2	3	90	0	90	Required
	Total	**14**				
	Elective courses	**5**				
	Cloud Computing Specialization					
9	Management information system **	2	30	30	0	Elective
10	Cloud computing	2	30	30	0	Elective
11	Cloud Computing – Practice	1	30	0	30	Elective

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
	Specialization in Embedded and Mobile Systems					
12	Management information system **	2	30	30	0	Elective
13	Mobile device programming	2	30	30	0	Elective
14	Mobile Programming – Practice	1	30	0	30	Elective
	Total	**19**				

7.8. Semester

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
	Required Courses					
1	Software testing	2	30	30	0	Required
2	Software Testing – Practice	1	30	0	30	Required
3	Research methods and writing scientific reports	2	30	30	0	Required
4	Information technology project management	2	30	30	0	Required
5	Information Technology Project Management – Practice	1	30	0	30	Required
6	Final Internship IT	4	120	0	120	Required
	Total	**12**				
	Elective courses	**6**				
7	Graduation Thesis IT	6	180	0	180	Elective
	Study alternative course for graduation thesis	**6**				
	Cloud Computing Specialization					
8	Development of Management Information Systems	2	30	30	0	Elective
9	Development of Management Information Systems - Practice	1	30	0	30	Elective

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
10	Blockchain Technology	2	30	30	0	Elective
11	Blockchain Technology – Practice	1	30	0	30	Elective
	Specialization in Embedded and Mobile Systems					
12	Blockchain Technology	2	30	30	0	Elective
13	Blockchain Technology – Practice	1	30	0	30	Elective
14	WPF Programming	2	30	30	0	Elective
15	WPF Programming - Practice	1	30	0	30	Elective
	Total	**18**				

(*) 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