MINISTRY OF EDUCATION & TRAINING
NAM CAN THO UNIVERSITY

SOCIALIST REPUBLIC OF VIETNAM
Independence – Freedom – Happiness

PROGRAM CURRICULUM
SOFTWARE ENGINEERING

(Issued under Decision No: 143 /QD-ĐHNCT dated February 27, 2021 of Rector of Nam Can Tho University)

Program name: **Software Engineering**
Education level: **Full-time university**
Course of study: **Software Engineering**
Code: **7480103**
Type of training: **Formal**

1. Description of the training program

1.1 About the training program

The Software Engineering program trains students to become Bachelor of Software Engineering with full physical strength, good health, ethics and social responsibility, professional knowledge, and skills to develop software systems and propose and implement solutions to carry out the software development phases. Can take up career positions in the field of Software Engineering. Capable of lifelong learning and professional development in the software field at home and abroad.

1.2 General information about the training program

Program name (Vietnamese)	Kỹ thuật phần mềm
Program name (English)	Software Engineering
Training branch code	7480103
Degree School	Nam Can Tho University
Diploma title	Bachelor of Software Engineering
Degree training	University
Number of credits required	132 credits
Forms of training	Formal
Training time	4 years
Enrollment object	High school graduates
Assessment scale	10
Graduation conditions	- Accumulate a sufficient number of courses and the volume of the training program reaches 133 credits; - The cumulative GPA of the whole course is 5.0 or higher; - Meet the output standards of English and computer skills according to the general regulations of the University; - Meet the output standards of Soft skills and Vocational

	skills; - Possess a Certificate of Defense - Security Education and complete the required modules.
Job position	- Software engineers with roles: analysts, programmers, testers, maintainers, programming team leaders, project leaders in software companies, consulting companies - solution design information technology (IT) for businesses, IT operation and development departments of agencies and organizations. - Software production business owner. - IT research and application staff in IT research and transfer institutes and schools. - IT lecturers in universities, colleges, high schools, professional and vocational schools.
Ability to study, improve qualifications after graduation	- Form a habit of lifelong learning, have the ability to update knowledge, continue to study and study in depth about Software Engineering, be creative at work - Satisfies with academic requirements at graduate level in the field of Software Engineering.
Reference when building training programs	Undergraduate training program in Software Engineering, School of Information and Communication Technology, Can Tho University, University of Information Technology in Ho Chi Minh City. Ho Chi Minh City, University of Natural Sciences, Ho Chi Minh City. Ho Chi Minh. National University of Singapore, Allahabad University of India.
Description update time	02/2021

1.3 Training Objectives

1.3.1 General objective

− Training human resources with bachelor's degree, full health, ethical qualities, solid professional knowledge to meet social requirements.

− Provide students with basic and in-depth knowledge, skills to analyze, synthesize, set up solutions, operate, develop thinking ability, practice ethics and professional skills.

− Capable of lifelong learning and ability to work in software field at home and abroad.

1.3.2 Detail goal

M1: Training students to have full physical strength, health, ethics, professional responsibility and social responsibility. Understand and apply foundational and in-depth knowledge of IT and Software Engineering in professional work.

M2: Equip students with foundational knowledge and skills to develop embedded software & IoT systems, business software or simulation software. Meet the requirements of professional skills, thereby developing creative capacity at work.

M3: Equip students with solid professional knowledge and skills to meet various jobs related to analysis, design, installation, testing and maintenance of software systems, management manage software projects and develop careers to senior positions, holding management and leadership roles.

M4: Organize and perform professional activities, thereby developing the corresponding competencies in life. Build self-research capacity in specialized fields.

M5: Train students to have professional manners, communication skills, teamwork skills, lifelong learning skills, ability to conduct scientific research, adaptability and work in the field software engineering at home and abroad.

2. TRAINING TIME: 4 years

3. VOLUME OF COURSE KNOWLEDGE

Knowledge of the whole course: 132 credits (excluding Physical Education and Defense - Security modules), distributed as follows:

BLOCK OF KNOWLEDGE	Obligatory knowledge	Elective knowledge	Total
General curriculum	34	2	**36**
Professional education knowledge	84	12	**96**
- Basic industry knowledge	32	0	*32*
- Specialized knowledge	33	12	45
- Additional knowledge	5	0	5
- Graduation internship / Graduate chemistry thesis /Alternative subjects	14	0	14
+ Graduation internship	*4*	*0*	*4*
+ Graduation thesis and alternative subjects	*10*	*0*	*10*
total weight	**118**	**14**	**132**

4. SUBJECTS SMALL

5. TRAINING PROCESS, GRADUATION CONDITIONS

5.1 Training process

Implement regulations on formal university and college training according to the current credit system and training regulations of Nam Can Tho University.

5.2 Graduation conditions

- Students who complete the training program shall be considered for graduation and recognized for graduation according to article 27 of the training regulations under the credit system.

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

- Obtained the Certificate of Defense and Security Education; Physical education; Soft Skills and Professional Skills.

- Assessment of department and module grades shall comply with articles 22 and 23 of the training regulations under the credit system.

- Academic year ranking, graduation ranking shall comply with articles 14 and 28 of the training regulations under the credit system.

6. CONTENT

6.1 General curriculum

No.	Course code	Course name	Credit number	Theory	Practice	Category
A	**Political theory**		**11**			
1	CT001	Philosophy	3	3	0	OB
2	CT002	Political Economy	2	2	0	OB
3	CT003	Science socialism	2	2	0	OB
4	CT004	Ho Chi Minh Thought	2	2	0	OB
5	CT005	History of the Communist Party of Vietnam	2	2	0	OB
REMOVE	**Humanities and Social Sciences**		**4**			
6	XH001	General law	2	2	0	OB
7	XH002	Text and archiving outline	2	2	0	OP
8	XH003	Communication skills	2	2	0	OP
9	XH004	People and the environment	2	2	0	OP
OLD	**Foreign Language**		**9**			
ten	AV001	Basic English 1	3	3	0	OB
11	AV002	Basic English 2	3	3	0	OB
twelfth	AV003	Basic English 3	3	3	0	OB
EASY	**Math, Informatics, Natural Science**		**12**			
13	CB001	Advanced Math 1	3	3	0	OB
14	CB002	Advanced Math 2	3	3	0	OB
15	CB006	Probability theory and mathematical statistics	3	3	0	OB
16	CB007	General Physics	3	3	0	OB
E	***Physical education ****		**3**			
17	OP001	Physical Education 1 (*)	1		1	CD
18	OP002	Physical Education 2 (*)	1		1	CD
19	OP003	Physical Education 3 (*)	1		1	CD
F	***Defense and security education ****		**8**			

20	QP001	QDQP1: Military line of the Party	3			CD
21	QP002	QDQP2: Defense – Security work	2			CD
22	QP003	GDQP3: General and tactical military, AK, CKC submachine gun shooting techniques)	3			CD

(*) Conditional courses, cumulative GPA is not calculated

6.2 Professional education knowledge

No.	Course code	Course name	Credit number	Theory	Practice	Category
Sector knowledge base			**32**			
1	TT001	Data structures and algorithms	3	3	0	OB
2	TT002	Discrete math	3	3	0	OB
3	TT003	Computer architecture	2	2	0	OB
4	TT052	General information	3	2	1	OB
5	TT004	Programming techniques	3	2	1	OB
6	TT005	Operating system	3	2	1	OB
7	TT006	Internet	2	1	1	OB
8	TT007	Database	3	2	1	OB
9	TT008	Object Oriented Programming	3	2	1	OB
10	TT009	Artificial intelligence	3	2	1	OB
11	CB018	Scientific research method	2	2	0	OB
12	TT040	Introduction Software Technology	2	2	0	OB
Main specialized knowledge section			**45**	**33**	**12**	
General industry knowledge			*33*	*33*	*0*	
1	TT010	English for specific purposes	2	2	0	OB
2	TT018	Modeling language UML	2	1	1	OB
3	TT053	Software Architecture	2	2	0	OB
4	TT054	Software requirements analysis	2	2	0	OB
5	TT055	Design software	2	2	0	OB
6	TT056	Software Testing	2	2	0	OB
7	TT057	Software Quality Assurance	2	2	0	OB
8	TT058	Software maintenance	2	2	0	OB
9	TT012	Database management system	3	2	1	OB

No.	Course code	Course name	Credit number	Theory	Practice	Category
10	TT014	Analysis and design of information systems	3	2	1	OB
11	TT015	Information technology project management	2	2	0	OB
12	TT020	.NET technology	2	1	1	OB
13	TT059	Study project part 1	2	0	2	OB
14	TT060	Study project part 2	2	0	2	OB
15	TT061	Study project part 3	2	0	2	OB
In-depth knowledge of the main industry			*12*	*0*		
Choose 1 of 2 directions						
** In-depth direction on Cloud Computing*			*12*			
1	TT062	XML Technology	2	1	1	OP
2	TT063	Distributed systems	3	2	1	OP
3	TT064	Information safety and security	2	1	1	OP
4	TT065	Cloud computing services and infrastructure	3	2	1	OP
5	TT066	Virtualization technology	2	1	1	OP
** In-depth direction on Embedded and Mobile Systems*			*12*			
1	TT067	Embedded system programming	2	1	1	OP
2	TT068	Real-time system	2	1	1	OP
3	TT069	Mobile programming	3	2	1	OP
4	TT070	Design the theme	3	2	1	OP
5	TT071	Safe programming	2	1	1	OP
Additional knowledge			***5***	***5***	***0***	
1	TT072	Software engineering economics	2	2	0	OB
2	TT051	Ecommerce	3	2	1	OB
Graduation internship and thesis work			**14**	14	0	
3	TT073	Graduation internship	4	0	4	OB
4	TT074	Graduation essay	10	0	ten	OB
Courses to replace Graduation Thesis			**10**			
5	TT075	Graduate essay	4	0	0	OP
6	TT076	Open-source software development	3	2	1	OP
7	TT077	Simulation programming	3	2	1	OP

7. TEACHING PLAN (INTENDED)

7.1 In-depth direction on Cloud Computing

- **Semester** 1

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 1	3	45	45	0	OB
2	Advanced Math 1	3	45	45	0	OB
3	Philosophy	3	45	45	0	OB
4	General information	3	60	30	30	OB
5	General Physics	3	60	30	30	OB
6	*Physical Education 1* *	1	30	0	30	CD
7	*Defense Education* *	8	165	75	90	CD
	total accumulated credits	**15**				

- **Semester** 2

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 2	3	45	45	0	OB
2	Advanced Math 2	3	45	45	0	OB
3	Political Economy	2	30	30	0	OB
4	Computer architecture	2	45	15	30	OB
5	Programming techniques	3	60	30	30	OB
6	General law	2	30	30	0	OB
7	Probability theory and mathematical statistics	3	45	45	0	OB
8	*Physical Education 2**	1	30	0	30	CD
	total accumulated credits	**18**				

- **Semester 3**

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 3	3	45	45	0	OB
2	Science socialism	2	30	30	0	OB
3	Data structures and algorithms	3	60	30	30	OB
4	Discrete math	3	45	45	0	OB

5	Database	3	60	30	30	OB
6	Software Technology Introduction	2	30	30	0	OB
7	Scientific research method	2	30	30	0	OB
8	Physical Education 3*	1	30	0	30	CD
	total accumulated credits	**18**				

- **Semester** 4

No.	**Course name**	**Credit number**	**Total period**	**Number of periods**		**Category**
				Theory	**Practice**	
1	Ho Chi Minh Thought	2	30	30	0	OB
2	Software Architecture	2	30	30	0	OB
3	Internet	2	30	30	0	OB
4	Object Oriented Programming	3	60	30	30	OB
5	Analysis and design of information systems	3	60	30	30	OB
6	Operating system	2	60	30	30	OB
7	Study project part 1	2	60	0	60	OB
	total accumulated credits	**16**				

- **Semester** 5

No.	**Course name**	**Credit number**	**Total period**	**Number of periods**		**Category**
				Theory	**Practice**	
1	History of the Communist Party of Vietnam	2	30	30	0	OB
2	Modeling language UML	2	45	15	30	OB
3	PM . request analysis	2	30	30	0	OB
4	Design software	2	30	30	0	OB
5	Database management system	3	60	30	30	OB
6	.NET technology	2	60	30	30	OB
7	Cloud computing services and infrastructure	3	60	30	30	OB
8	Study project part 2	2	60	0	60	OB
	total accumulated credits	**18**				

Semester 6

No.	Course name	Credit number	Total period	Number of periods		Category_
				Theory	Practice	
1	Testing PM	2	30	30	0	OB
2	PM Quality Assurance	2	30	30	0	OB
3	English for specific purposes	2	30	30	0	OB
4	Artificial intelligence	3	60	30	30	OB
5	Distributed systems	3	60	30	30	OP
6	Elective General Knowledge (Social Science)	2	30	30	0	OP
7	Study project part 3	2	60	0	60	OB
	total accumulated credits	**16**				

Semester 7

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	IT project management	2	45	15	30	OB
2	Information safety and security	2	45	15	30	OP
3	XML Technology	2	45	15	30	OP
4	Virtualization technology	2	45	15	30	OP
5	Software maintenance	2	30	30	0	OB
6	Ecommerce	3	60	30	30	OB
7	Software engineering economics	2	30	30	0	OB
	total accumulated credits	**15**				

Semester 8

No.	Course name		Credit number	Total period	Number of periods		Category
					Theory	Practice	
1	Graduation internship		4	120	0	120	OB
2	Graduation essay		ten	300	0	300	OP
3	Essay	*Choose an alternative course for the*	4	120	0	120	OP
4	Open source software development		3	60	2	1	OP

5	Simulation programming	*Graduation Thesis*	3	60	2	1	OP
	total accumulated credits		**14**				

7.2 In-depth direction on Embedded and Mobile Systems

- **Semester** 1

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 1	3	45	45	0	OB
2	Advanced Math 1	3	45	45	0	OB
3	Philosophy	3	45	45	0	OB
4	General information	3	60	30	30	OB
5	General Physics	3	60	30	30	OB
6	*Physical Education 1* *	1	30	0	30	CD
7	*Defense Education* *	8	165	75	90	CD
	total accumulated credits	**15**				

- **Semester** 2

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 2	3	45	45	0	OB
2	Advanced Math 2	3	45	45	0	OB
3	Political Economy	2	30	30	0	OB
4	Computer architecture	2	45	15	30	OB
5	Programming techniques	3	60	30	30	OB
6	General law	2	30	30	0	OB
7	Probability theory and mathematical statistics	3	45	45	0	OB
8	*Physical Education 2* *	1	30	0	30	CD
	total accumulated credits	**18**				

- **Semester** 3

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Basic English 3	3	45	45	0	OB
2	Science socialism	2	30	30	0	OB
3	Data structures and algorithms	3	60	30	30	OB

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
	Discrete math	3	45	45	0	OB
4	Database	3	60	30	30	OB
5	Introduction Software Technology	2	30	30	0	OB
6	Scientific research method	2	30	30	0	OB
7	*Physical Education 3**	1	30	0	30	CD
	total accumulated credits	**18**				

Semester 4

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Ho Chi Minh Thought	2	30	30	0	OB
2	Software Architecture	2	30	30	0	OB
3	Internet	2	30	30	0	OB
4	Object Oriented Programming	3	60	30	30	OB
5	Analysis and design of information systems	3	60	30	30	OB
6	Study project part 1	2	60	0	60	OB
7	Operating system	2	60	30	30	OB
	total accumulated credits	**16**				

Semester 5

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	History of the Communist Party of Vietnam	2	30	30	0	OB
2	Modeling language UML	2	45	15	30	OB
3	Software requirements analysis	2	30	30	0	OB
4	Design software	2	30	30	0	OB
5	Database management system	3	60	30	30	OB
6	.NET technology	2	60	30	30	OB
7	Design the theme	3	60	30	30	OP
8	Study project part 2	2	60	0	60	OB
	Total accumulated credits	**18**				

Semester 6

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	Software Testing	2	30	30	0	OB
2	Software Quality Assurance	2	30	30	0	OB
3	English for specific purposes	2	30	30	0	OB
4	Artificial intelligence	3	60	30	30	OB
5	Mobile programming	3	60	30	30	OP
6	Elective General Knowledge (Social Science)	2	30	30	0	OP
7	Study project part 3	2	60	0	60	OB
	total accumulated credits	**16**				

Semester 7

No.	Course name	Credit number	Total period	Number of periods		Category
				Theory	Practice	
1	IT project management	2	45	15	30	OB
2	Embedded system programming	2	45	15	30	OP
3	Safe programming	2	45	15	30	OP
4	Real-time system	2	45	15	30	OP
5	Software maintenance	2	30	30	0	OB
6	Ecommerce	3	60	30	30	OB
7	Software engineering economics	2	30	30	0	OB
	total accumulated credits	**15**				

Semester 8

No.	Course name		Credit number	Total period	Number of periods		Category
					Theory	Practice	
1	Graduation internship		4	120	0	120	OB
2	Graduation essay		ten	300	0	300	OP
3	Essay	*Choose an alternative course for the Graduation Thesis*	4	120	0	120	OP
4	Open source software development		3	60	2	1	OP
5	Simulation programming		3	60	2	1	OP

	total accumulated credits	**14**				

8. INSTRUCTIONS FOR IMPLEMENTATION OF THE PROGRAM

8.1 For Faculty and Department

The Faculty and Department are responsible for reviewing, presiding over, and compiling detailed outlines of modules in the basic knowledge of disciplines, majors, and specialties according to the number of credits of this program. Provide the list of textbooks, lectures and reference materials of all courses to the University Library and keep it in the Faculty Office. At the beginning of each semester, coordinate with units of the University to implement the training plan on schedule.

Assign lecturers with a master's degree or higher (in the same discipline or related discipline) to teach theoretical courses, and provide detailed course outlines for lecturers to ensure that they follow the general teaching plan of the University.

Academic advisors must thoroughly understand the entire credit-based training program to guide students to register for courses.

8.2 For lecturers

When a lecturer is assigned to teach one or more modules, it is necessary to carefully study the content of the detailed course outline in order to prepare lectures and appropriate teaching aids and tools.

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

Organizing Seminar, focusing on organizing group study and guiding students to make essays, projects, lecturers identify methods of transmission; class presentations, guide discussions, solve problems in class, in practice rooms, in laboratories and guide students to write essays.

Interested in developing students' self-study and self-research ability during the teaching process and guiding practice and practice.

Attention should be paid to the logic of imparting and absorbing knowledge blocks, specifying prerequisite courses for compulsory courses, and preparing teachers to meet the requirements of teaching elective courses.

8.3 For students

You must consult with your academic advisor to choose the right course for your schedule. You must study the lesson yourself before going to class to easily absorb the lecture. Make sure you have enough time in class to listen to the instructor's lecture instructions. Self-discipline in self-study and self-study, and at the same time actively participate in group learning, fully attend Seminar sessions.

Actively and actively exploit resources online and in the school's library to serve self-study, self-research and graduation projects. Strictly comply with regulations on examination, examination and evaluation.

Regularly participate in mass and cultural activities to practice communication skills, understanding about society and people.

8.4 Facilities and equipment for teaching and practice, practice

System of theoretical/practical classrooms with traditional equipment, equipped with teaching aids (projectors); Software programs are designed and pre-installed to serve training and teaching.
The practice room for basic and specialized modules is installed with specialized sections for the software engineering industry. The practice room for basic and specialized modules is provided with specialized equipment and tools for the software engineering industry.

Rector

(Signature, full name, stamp)

Dr. NGUYEN VAN QUANG