MINISTRY OF EDUCATION AND TRAINING **SOCIALIST REPUBLIC OF VIET NAM**

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: Electrical and Electronic Engineering Technology

Level: Undergraduate

Major: Electrical, Electronic and Telecommunication Engineering Technology

Code: 75103

Type of education: Regular

1. Program description

1.1. Introduction to the program

1.2. General information about the program

Name of program in Vietnamese	Công nghệ Kỹ thuật Điện, Điện tử
Name of program in English	Electrical and Electronic Engineering Technology
Program code	7510301
Degree-granting institution	Nam Can Tho University
Degree	Electrical and Electronic Engineering Technology Engineer
Level	Undergraduate
The number of required credits	159
Type of education	Regular
Program duration	4 years
Eligible candidates for admission	High school graduates
Grading scale	4
Graduation requirements	- Accumulate a sufficient number of modules and the volume of the training program to reach 150 credits. - The cumulative GPA of the whole course is 2.0 or higher. - Have foreign language proficiency from Level 3 or higher (B1) according to the 6-level Foreign Language Proficiency Framework or equivalent. - Meet the output standards of Soft Skills and Vocational Skills. - Possess a certificate of National Defense and Security Education and complete the prerequisite modules.

Job opportunities	- Doing electrical and electronic engineering jobs in industrial enterprises. - Consulting, designing, constructing and managing projects in the fields of power supply, industrial electronics, automatic control, communication, production and repair of electrical equipment; lighting systems, security systems for industrial enterprises, urban areas, commercial centers, etc. - Working in regulatory agencies related to the field of electrical and electronic engineering. - Teaching subjects of Electrical and Electronic Engineering at universities, colleges and professional intermediate schools. - Scientific research in the field of electrical and electronic engineering in research institutes, centers and research agencies of ministries, branches, universities and colleges.
Postgraduate study options	- Continue to study postgraduate studies in the field of Electrical and Electronic Engineering such as: Electrical Engineering, Control and Automation, Civil Electronics, Electronics and Telecommunications, etc. - Research and implement applications of electrical and electronic engineering in practice. - Production management and administration.
Reference program	Undergraduate training program in Electrical and Electronic Engineering of the Institute of Post and Telecommunications Technology, Can Tho University, Can Tho University of Engineering and Technology, Hanoi University of Science and Technology, Ho Chi Minh City University of Technology and Education, Quang Ninh University of Industry.
Update time	December 2023

1.3. Mục tiêu đào tạo *(Program goals)*

1.3.1. Mục tiêu chung *(General goals)*

PO: The undergraduate training program in Electrical and Electronic Engineering Technology aims to train modern engineers with the ability to deduce and design new techniques, with practical experience in high-tech design to meet social requirements, with a creative tendency, political and ethical qualities; with health to meet the requirements of defending the country and with professional knowledge, professional practice capacity, ability to work in groups, ability to work independently and creatively to solve problems in the trained major, and ability to continue studying and researching to improve qualifications in the field of Electricity – Electronics.

1.3.2. Mục tiêu cụ thể *(Specific goals)*

- **PO1**: Equipping students with basic knowledge in the field of electrical and electronics as a premise for learning specialized knowledge.
- **PO2:** Equipping students with in-depth knowledge in the field of electrical and electronics in order to meet well for professional research and practice.
- **PO3:** Ability to apply mathematical, scientific, and technical knowledge to problems in the field of civil and industrial electrical and electronics.
- **PO4:** Ability to design and conduct experiments, analyze and interpret data in the field of electrical and electronics.
- **PO5:** The ability to organize and supervise the operation of electrical systems and automatic systems in factories and enterprises to meet the desired needs with practical constraints such as economic, environmental, social, political, ethical, health and safety and sustainability.
- **PO6:** Ability to update new and creative knowledge at work. Have a progressive spirit, passion for scientific research and a sense of self-study and self-development, capable of studying Diploma 2 for almost all disciplines such as: Electronics - Telecommunications Engineering, Control and Automation Engineering, Mechatronics Engineering, Computer Engineering, etc …
- **PO7:** To have political and moral qualities; to be in good health to meet the requirements of national defense and in professional work.

1.4. Student learning outcomes

a. Knowledge

- **SO1:** Apply basic knowledge of political science, society, law, national security and defense, physical education in study and professional activities, social activities, health training to study, work, perform civic responsibilities and protect the Fatherland.
- **SO2:** Apply basic, fundamental and specialized knowledge to study, research and practice in the field of electrical and electronic engineering technology.

b. Skills

- **SO3:** Use English in communication and professional skills according to the output standards of the Ministry of Education and Training.
- **SO4:** Ability to design, test, operate, improve, maintain and repair electrical and electronic equipment and systems.
- **SO5:** Ability to update new technology and techniques, digital transformation, effectively use artificial intelligence (AI) and other modern means.
- **SO6:** Ability to plan, organize, and administer professional activities.
- **SO7:** Ability to work in teams to perform assigned tasks.

c. Năng lực tự chủ và trách nhiệm *(Capacity for autonomy and responsibility)*

- **SO8:** Obey the law, properly and fully implement the rights and obligations of citizens and actively fight against negative manifestations.
- **SO9:** Implement 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	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 thinking, 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 reference materials	- Expand and deepen knowledge, helping learners access multi-dimensional information, beyond the scope of basic curriculum. - Develop self-study capacity, practice 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	10

			(Essay, multiple choice, oral, thematic report...).	
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: 159 credits (excluding the Physical Education and Defense and Security Education courses), distributed as follows:

Knowledge	Obligatory knowledge	Elective knowledge	Total
General knowledge	43	0	43
Professional knowledge	108	8	116
Fundamental knowledge	41	0	41
Specialized knowledge	53	8	61
Graduation internship	6	0	6
Graduation thesis/Alternative courses	8	0	8
Total	151	8	159

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	0301001769	Marxist-Leninist philosophy	3	3	0	Required
2	0301001825	Marxist-Leninist Political Economy	2	2	0	Required
3	0301001826	Scientific Socialism	2	2	0	Required
4	0301001827	History of the Communist Party of Vietnam	2	2	0	Required
5	0301000665	Ho Chi Minh Thought	2	2	0	Required
B	**Social Sciences and Humanities**					
6	0301000667	General Law	2	2	0	Required
7		Soft Skills	2	2	0	Required
C	**Foreign languages**					
8	0301000946	Basic English 1	3	3	0	Required
9	0301000947	Basic English 2	3	3	0	Required
10	0301000948	Basic English 3	3	3	0	Required
D	**Mathematics - Information Technology - Natural Sciences**					
11	0301000679	Basic Informatics	3	2	1	Required
12	0301000670	Advanced Math 1	3	3	0	Required
13	0301000671	Advanced Math 2	3	3	0	Required
14	0301000672	Linear Algebra	2	2	0	Required
15	0301000673	Probability – Statistics	3	3	0	Required
16		General Physics	3	3	0	Required
17	0301000978	Research and writing scientific reports methods	2	2	0	Required
E	**Physical education**					
18	0301001035	Physical Education 1	1	0	1	Elective
19	0301000660	Physical Education 2	1	0	1	Elective
20	0301001030	Physical Education 3	1	0	1	Elective
F	**Giáo dục quốc phòng – An ninh** *(National Defense Education)*					
21	0301000650	National defense and security education (*)	8	3	5	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						
22	0301001083	Engineering Math	2	2		Required
23		Electromagnetic Field	2	2		Required
24		Signal and Systems Theory	2	1	1	Required
25	0301001280	Circuit Theory	3	3		Required
26	0301001084	Electronic Components	3	2	1	Required
27	0301001668	Mạch điện tử Analog (Analog Circuits)	2	2		Required
28	0301001669	Analog Circuits Lab	2		2	Required
29	0301002408	Digital Circuits	2	2		Required
30	0301000703	Digital Circuits Lab	2		2	Required
31	0301002527	Pulse Engineering	2	1	1	Required
32	0301000276	Basic Programming – Electronics	2	2		Required
33	0301000704	Basic Programming – Practice - Electronics	2		2	Required
34	0301001019	English for Specific Purposes	3	3		Required
35	0301001646	Microprocessors	2	2		Required
36	0301001647	Microprocessors Lab	2		2	Required
37	0301001278	Electrical Devices – Electrical Safety	2	2		Required
38	0301001286	Electrical Engineering	2	2		Required
39	0301002521	Electrical Engineering Lab	2		2	Required
40	0301001285	Electric Power System 1, 2	2	2		Required
Specialized knowledge						
41	0301002016	Audio and Video Techniques	4	2	2	Required
42	0301001662	Power Electronics	2	2		Required
43	0301002427	Power Electronics Lab	2		2	Required
44	0301001279	Electrical and Electronics Engineering Practice	2		2	Required
45	0301000502	Electrical system design	2	2		Required
46	0301002459	Electrical system design Lab	1		1	Required
47	0301002388	Data Communication	3	2	1	Required
48	0301000256	Refrigeration Engineering	3	1	2	Required

No.	Course code	Course name	Number of credits	Theory	Practice	Category
49	0301001316	Programmable Logic Controllers	3	2	1	Required
50	0301001302	Sensor	3	2	1	Required
51	0301002390	Linear system automatic control theory	3	3		Required
52	0301001306	Matlab and Labview	3	2	1	Required
53	0301002024	Renewable Energy	2	2		Required
54	0301002391	IoTs Facilities and Applications	3	2	1	Required
55	0301002020	Robotics Engineering	2	2		Required
56	0301001303	Computer Hardware Engineering	3	1	2	Required
57	0301000729	Industrial Automatic Control Engineering	3	1	2	Required
58	0301001305	Printed Circuit Board (PCB) Design	3	2	1	Required
59	0301002019	Electrical CAD	3	2	1	Required
60	0301000378	Junior Project on Electrical - Electronics 1	1		1	Required
61	0301000381	Junior Project on Electrical - Electronics 2	1		1	Required
62	0301001476	Field visit	1		1	Required
Elective course of specialized knowledge 1 (Students choose 8 credits)						
63	0301002396	Hydraulic and pneumatic technology	3	2	1	Elective
64	0301002022	Embedded Programming	3	2	1	Elective
65	0301001308	Fuzzy Control	3	2	1	Elective
66	0301001307	Smart measurement.	3	2	1	Elective
67	0301002023	Artificial neural networks	3	2	1	Elective
68	0301001311	Lighting Engineering	2	2		Elective
69	0301002026	Power Plant	2	2		Elective
70	0301002027	Energy storage in the power system	2	2		Elective
71	0301002028	Power Management and Usage	2	2		Elective
Graduation internship						
72	0301002393	Graduation internship	6		180	Required
Graduation thesis/Alternative courses						

No.	Course code	Course name	Number of credits	Theory	Practice	Category
73	0301002395	Graduation thesis	8		240	Elective
Alternative courses						
74	0301000554	Graduation essay	4		120	Elective
75	0301002028	Evaluation of the reliability of the electrical system	2	30		Elective
76	0301002025	Short circuit and power system stability	2	30		Elective
77	0301000252	High Voltage Engineering	2	30		Elective
78	0301000104	Industrial Electronics	2	30		Elective
79	0301001281	Fundamentals of Telecommunications	2	30		Elective
80	0301000170	Telecommunication system	2	30		Elective
81		Microwave Engineering	2	30		Elective
Choose Graduation Essay and 2 subjects			8			

7. Tentative teaching plan

7.1. Semester 1

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	General Law	2	30	30	0	Required
2	Probability – Statistics	3	45	45	0	Required
3	Advanced Math 1	3	45	45	0	Required
4	Linear Algebra	2	30	30	0	Required
5	Electronic Components	3	60	30	30	Required
6	Soft Skills	2	30	30	0	Required
7	Basic Computer Science	3	60	30	30	Required
8	Physical Education 1 – Volleyball	1	30	0	30	Elective
9	Physical Education 1 – Football					
10	Physical Education 1 – Badminton					
	Total	**19**				

7.2. Semester 2

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Marxist-Leninist philosophy	3	45	45	0	Required
2	Basic English 1	3	45	45	0	Required
3	Engineering Math	2	30	30	0	Required
4	Advanced Math 2	3	45	45	0	Required
5	General Physics	3	45	45	0	Required
6	Electromagnetic Field	2	30	30	0	Required
7	Physical Education 1 – Volleyball	1	30	0	30	Elective
8	Physical Education 1 – Football					
9	Physical Education 1 – Badminton					
	Total	**17**	**270**	**240**	**30**	

7.3. Semester 3

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Marxist-Leninist Political Economy	2	30	30	0	Required
2	Basic English 2	3	45	45	0	Required
3	Basic English 3	3	45	45	0	Required
4	Defense and Security Education	8	165	75	90	Required
	Total	**16**	**285**	**195**	**90**	

7.4. Semester 4

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Scientific socialism	2	30	30	0	Required
2	Circuit Theory	3	45	45	0	Required
3	Electrical Devices – Electrical Safety	2	30	30	0	Required
4	Signal and Systems Theory	2	30	30	0	Required
5	Electrical Engineering	2	30	30	0	Required
6	Electrical Engineering Lab	2	60	0	60	Required
7	Pulse Engineering	2	45	15	30	Required
8	Physical Education 1 – Volleyball	1	30	0	30	Elective
9	Physical Education 1 – Football					

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
10	Physical Education 1 – Badminton					
	Total	**16**	**300**	**180**	**120**	

7.5. Semester 5

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	Analog Circuits	2	30	30	0	Required
3	Analog Circuits Lab	2	60	0	60	Required
4	Basic Programming – Electronics	2	30	30	0	Required
5	Basic Programming – Practice - Electronics	2	60	0	60	Required
6	Digital Circuit	2	30	30	0	Required
7	Digital Circuit Lab	2	60	0	60	Required
	Total	**14**	**300**	**120**	**180**	

7.6. Semester 6

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Ho Chi Minh Thought	2	30	30	0	Required
2	Printed Circuit Board (PCB) Design	3	60	30	30	Required
3	English for Specific Purposes	3	45	45	0	Required
4	Electrical System 1, 2	2	30	30	0	Required
5	Microprocessor	2	30	30	0	Required
6	Microprocessors Lab	2	60	0	60	Required
	Total	**14**	**255**	**165**	**90**	

7.7. Semester 7

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
1	Research and writing scientific reports methods	2	30	30	0	Required
2	Audio and Video Techniques	4	90	30	60	Required

No.	Course name	Number of credits	Total periods	Class periods		Category
				Theory	Practice	
3	Electrical and Electronics Engineering Practice	2	60	0	60	Required
4	Power Electronics	2	30	30	0	Required
5	Power Electronics Lab	2	60	0	60	Required
6	Junior Project on Electrical - Electronics 1	1	30	0	30	Required
	Total	**13**	**300**	**90**	**210**	

7.8. Semester 8

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
1	Data Communication	3	60	30	30	Required
2	Matlab and Labview	3	60	30	30	Required
3	Electrical system design	2	30	30	0	Required
4	Electrical system design Lab	1	30	0	30	Required
5	Linear system automatic control theory	3	45	45	0	Required
	Total	12	225	135	90	

7.9. Semester 9

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
1	Electrical CAD	3	60	30	30	Required
2	Sensor	3	60	30	30	Required
3	Computer Hardware Engineering	3	75	15	60	Required
4	Field visit	1	60	0	60	Required
5	Power Plant	2	30	30	0	Required
6	Energy storage in the power system	2	30	30	0	Required
7	Power Management and Usage	2	30	30	0	Required
8	Lighting Engineering	2	30	30	0	Required
	Total	18	375	195	180	

7.10. Semester 10

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
1	Programmable logic controlers (PLC)	3	60	30	30	Required

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
2	Renewable Energy	2	30	30	0	Required
3	IoTs Facilities and Applications	3	60	30	30	Required
4	Refrigeration Engineering	3	75	15	60	Required
5	Junior Project on Electrical - Electronics 2	1	30	0	30	Required
	Total	12	255	105	150	

7.11. Semester 11

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
1	Industrial Automatic Control Engineering	3	75	15	60	Required
2	Robotics Engineering	2	30	30	0	Required
3	Fuzzy Control	3	60	30	30	Required
4	Embedded Programming	3	Elective 6 credits	90	90	0	Elective
5	Hydraulic and pneumatic technology	3					
6	Artificial neural networks	3					
7	Smart measurement	3					
	Total	11	225	165	90	

7.12. Semester 12

No.	Course name	Total		Class periods		Category
		Credits	Periods	Theory	Practice	
1	Graduation internship	6	180	0	180	Required
2	Type 1: Graduation thesis	8	240	0	240	Elective
3	Type 2: choose graduation essay and 2 courses*	8	240	0	240	Elective
	Graduation essay	4	Choose Graduation Essay and 2 courses			
	Evaluation of the reliability of the electrical system	2				
	Short circuit and power system stability	2				
	High Voltage Engineering	2				
	Industrial Electronics	2				
	Telecommunications	2				
	Telecommunication system	2				
	Microwave Engineering	2				
	Total	8				

(*) 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 advisors 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.
- Basic and specialized practice rooms are updated with new content.
- The computer lab is installed with software for basic computer training, computer graphics applications, computer design applications, and computer simulation applications.

Hiệu trưởng RECTOR	Phòng Quản lý Đào tạo DEPARTMENT OF ACADEMIC AFFAIRS	Khoa FACULTY