MINISTRY OF EDUCATION AND TRAINING
QUY NHON UNIVERSITY

MASTER'S PROGRAM

Level of education: **Master's**

Major: **Telecommunications Engineering**

Code: **8520208**

Orientation: **Application-Oriented Program**

Type of education: **Full-time**

***Binh Dinh*, 2024**

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QUY NHON UNIVERSITY

SOCIALIST REPUBLIC OF VIET NAM
Independence - Freedom - Happiness

MASTER'S PROGRAM

(Issued together with Decision No. 4502/QĐ-ĐHQN dated December 19, 2024 of the Rector of Quy Nhon University)

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1. PROGRAM OBJECTIVES

1.1. General objectives

Equip students with advanced research-oriented knowledge, enhancing both theoretical and practical expertise. The program aims to develop independent research capabilities, creativity, and the ability to detect and resolve complex problems within the field of Telecommunications Engineering.

This application-oriented curriculum is designed to meet national standards and elevate the professional qualifications of learners.

1.2. Specific objectives (POs)

Graduates with a Master's in Telecommunications Engineering will possess:

- Regarding Knowledge

PO1: Possess advanced knowledge of social sciences, political science, and law.

PO2: Acquire deep professional expertise in the major to effectively adapt to various job positions in the fields of electronics and telecommunications engineering, integrated circuit (IC) design, and Artificial Intelligence (AI).

PO3: Gain specialized knowledge in analyzing, operating, and evaluating a system or a component within electronic and telecommunication systems, embedded systems and IoT, and AI systems to meet practical work requirements.

- Regarding Skills

PO4: Possess communication skills, teamwork skills, and critical thinking to work effectively in multidisciplinary environments.

PO5: Demonstrate professional skills, information technology proficiency, and foreign

language competence in professional activities.

PO6: Possess skills in self-research, analysis, and solving practical problems; have the ability to formulate ideas, design, implement, and operate products in the fields of telecommunications engineering, integrated circuit (IC) design, embedded systems and IoT to meet societal development needs.

- Regarding Autonomy and Responsibility

PO7: Demonstrate a clear awareness of lifelong self-learning and research ; maintain professional ethics and responsibility toward work, the community, and society.

2. CAREER OPPORTUNITIES AND FURTHER EDUCATION

Graduates of the Telecommunications Engineering program are qualified to:

- Work in agencies, companies, corporations, or postal and telecommunications groups.
- Teach at universities, colleges, and professional secondary schools.
- Conduct research at specialized institutes for Electronics, IT, and Communications.
- Pursue further advanced studies in Doctoral (PhD) programs at prestigious domestic and international institutions.

3. PROGRAM LEARNING OUTCOMES (PLOs)

The program is designed to ensure that graduates achieve the following learning outcomes:

3.1. Knowledge

+ Fundamental Knowledge

PLO1: Apply fundamental knowledge of political science and law to professional activities and daily life.

PLO2: Apply basic principles of electronics and telecommunications to calculations, simulations, and problem-solving within the telecommunications engineering field.

+ Advanced/Specialized Knowledge

PLO3: Utilize foundational knowledge in electronics and telecommunications to calculate and determine the models and operating characteristics of electronic systems, integrated circuits (IC), telecommunication systems, embedded systems, and IoT.

PLO4: Analyze and select specialized expertise in electronics and telecommunications for the calculation, design, and operation of electronic systems, integrated circuits (IC), telecommunication systems, embedded systems, IoT, and artificial intelligence (AI) systems.

3.2. Skills

+ General Skills

PLO5: Utilize communication, presentation, and teamwork skills to effectively achieve the objectives set by interdisciplinary groups.

PLO6: Effectively apply foreign language and information technology skills in communication and professional activities.

PLO7: Integrate knowledge blocks from basic sciences, core engineering, and specialized fields into technical analysis, reasoning, and the resolution of practical problems.

PLO8: Apply professional skills in design and experimentation to analyze and solve problems related to telecommunication systems, artificial intelligence, integrated circuits (IC), embedded systems, and IoT.

+ *Professional Skills*

PLO9: Analyze and assess design options for electronic systems and products, as well as technical solutions in the fields of electronics, IC design, telecommunications engineering, embedded systems, and IoT.

PLO10: Evaluate and select technical solutions for the operation, use, and exploitation of applied electronic systems, telecommunication systems, embedded systems, and IoT.

3.3. Autonomy and Responsibility

PLO11: Strictly adhere to regulations regarding professional ethics and responsibility; maintain discipline, an industrial working style, and a commitment to professional capacity building.

PLO12: Establish a habit of updating knowledge and a mindset for lifelong self-learning and research.

4. ADMISSION REQUIREMENTS

- Have graduated or met the conditions for recognition of undergraduate graduation (or equivalent or higher level) in a field compatible with Telecommunications Engineering;
- Possess a foreign language proficiency of Level 3 or above according to the 6-level Foreign Language Proficiency Framework for Vietnam;

***List of Suitable Undergraduate Majors*:** Eligible majors belong to the "Electrical, Electronics, and Telecommunications Engineering Technology" group (Code: 75103) and the "Electrical, Electronics, and Telecommunications Engineering" group (Code: 75202). These groups are defined in the Statistical List of Higher Education Training Majors *(issued with Circular No. 09/2022/TT-BGDĐT dated June 6, 2022, by the Ministry of Education and Training)*.

No	Prospective master's applicant major	Compatible undergraduate majors	Note
1	Telecommunications Engineering	Radar – Navigation Engineering	
2	Telecommunications Engineering	Electronics and Telecommunications Engineering	
3	Telecommunications Engineering	Electronics and Telecommunications Engineering Technology	

List of undergraduate majors requiring knowledge supplementation and corresponding supplementary courses:

No	Master's Admission Major	Major Requiring Knowledge Supplementation	Supplementary Courses	Note
1	Telecommunications Engineering	Electrical and Electronics Engineering.	- Wireless Communications. - Digital Communications.	The Faculty will propose supplementary courses based on specific cases
2	Telecommunications Engineering	Control Engineering and Automation.		
3	Telecommunications Engineering	Computer Engineering		
4	Telecommunications Engineering	Computer Engineering Technology		
5	Telecommunications Engineering	Information Technology		
6	Telecommunications Engineering	Electrical and Electronic Engineering Technology		
7	Telecommunications Engineering	Biomedical Engineering		
8	Telecommunications Engineering	Marine Engineering		
9	Telecommunications Engineering	Electrical Engineering		
10	Telecommunications Engineering	Remaining majors per the Regulation on the Statistical List of Training Fields in Higher Education *(issued according to Circular No. 09/2022/TT-BGDDT dated June 6, 2022, of the Ministry of Education and Training)*	- Wireless Communications. - Digital Communications. - Antenna and Propagation.	
11	Telecommunications Engineering	*Other majors are considered on a case-by-case basis*		

5. TARGET APPLICANTS

In accordance with the current Master's admission and training regulations of Quy Nhon University and the Ministry of Education and Training.

6. TRAINING DURATION AND TOTAL CREDIT LOAD

6.1. Training Duration: *2 years (24 months)*

6.2. Total Credit Load: 60 credits, including 06 internship credits and 09 graduation project (Final Project) credits.

Program Structure	Number of Credits
General Knowledge Section	**3**
Foundation and Specialized Knowledge	**42**
Compulsory courses	21
Elective courses	21
Practical Internship	**6**
Graduation Final Project Course	**9**
Total	**60**

7. TRAINING PROCESS AND GRADUATION CONDITIONS

7.1. Training Process

Training under the credit-based system in compliance with the current regulations of the Ministry of Education and Training and Quy Nhon University

7.2. Graduation Conditions

According to the current Regulations on Admission and Master's Level Training of the Ministry of Education and Training and Quy Nhon University:

a) Have completed all courses in the training program and successfully defended the capstone project;

b) Attain the required foreign language proficiency according to the program's learning outcomes prior to the graduation review; this must be evidenced by one of the diplomas or language certificates equivalent to Level 4 of the 6-level Foreign Language Proficiency Framework for Vietnam as specified in the Appendix of the current Regulations on Admission and Master's Level Training of Quy Nhon University, or other equivalent certificates announced by the Ministry of Education and Training; or possess a university degree or higher in a foreign language major, or a university degree or higher in another major where the program was conducted entirely in a foreign language;

c) Fulfill all responsibilities as prescribed by Quy Nhon University; not be subject to criminal prosecution and not be under any period of disciplinary action or academic suspension.

7.3. Awarded Degree Title

Vietnamese: BANG THAC SI KY THUAT VIEN THONG

English: THE DEGREE OF MASTER IN TELECOMMUNICATIONS ENGINEERING

8. ASSESSMENT METHODS AND GRADING SCALE

8.1. Grading Scale

10-point grading scale is used for all assessment forms in each course.

8.2. Assessment Forms, Criteria, and Weight

- Theory courses:

No.	Assessment Form	Assessment Criteria	Assessment Weight
1	**Continuous Assessment**	* Attendance assessment: full class attendance. * Students complete an individual test (in written or oral presentation form). - Test assessment criteria: correct answers or requirements as specified in the M4 of the course. * Group reports or major assignments as required by the instructor in charge of the course. - Assessment criteria: content, format, and presentation of reports and major assignments as specified in detail in the M4 of the course. * Essays as required by the instructor in charge of teaching. - Essay assessment criteria: correct answers or requirements as specified in detail in the M4 of the course.	40%
2	**Final Exam**	End-of-course Examination * Examination form: Written/Oral. - Exam assessment criteria: according to the answer key or requirements specified in detail in the M4 of the course. ** Examination form: Report/reflection paper/essay - Exam assessment criteria: content and format as specified in detail in the M4 of the course.	60%

- Professional internship course: 60% continuous assessment (supervisor at the internship facility); 40% oral report defense (evaluation members appointed by the faculty). Specific criteria are detailed in the course syllabus.

- Graduation Course (Final Project): Implemented in accordance with the current Master's admission and training regulations of Quy Nhon University.Specific criteria are detailed in the course syllabus.

9. TRAINING PROGRAM

No	Course Code		Course Name	Semester	Course Load			Prerequisite Code	Managing Faculty	Note
	Letter	No.			Total	Theory	Exercises, Practice,			

							Experiment			
I. General Knowledge Section					**3**					
I.1. Philosophy					*3*					
1	TNTH	501	Philosophy	1	3	2	1		DPESM	
II. Foundation and Specialized Knowledge Section					**48**					
II.1. Compulsory Section					***21***					
Foundation Knowledge					*12*					
2	KVTS	502	Advanced Digital Communications Systems	1	3	2	1		Faculty of Engineering & Technology	
3	KVDĐ	503	Mobile and Wireless Networks	1	3	2	1		Faculty of Engineering & Technology	
4	KVXL	504	Spatial-Temporal Signal Processing	1	3	2	1		Faculty of Engineering & Technology	
5	KVTT	505	Information Theory and Coding	1	3	2	1		Faculty of Engineering & Technology	
Specialized Knowledge					*15*					
6	KVPT	506	Analysis and Design of Wireless Communication Systems	2	3	2	1		Faculty of Engineering & Technology	
7	KVPA	507	Numerical Analysis and Design of Antennasanten	2	3	2	1		Faculty of Engineering & Technology	
8	KVCĐ	508	Advanced Communicatio	2	3	2	1		Faculty of Engineering	

			n Systems Topics						& Technology	
II.2. Elective Section					***21***					
Foundation Knowledge (select 12/24 credits)					*12*					
9	KVTP	511	Information Transceiver Systems	1	3	2	1		Faculty of Engineering & Technology	
10	KVVT	512	Next-Generation Telecommunications Networks	2	3	2	1		Faculty of Engineering & Technology	
11	KVCB	513	Wireless Sensor Networks	1	3	2	1		Faculty of Engineering & Technology	
12	KVGT	514	Protocols and Networks	2	3	2	1		Faculty of Engineering & Technology	
13	KVCN	515	Industrial Information Systems	2	3	2	1		Faculty of Engineering & Technology	
14	KVCX	516	Signal Processing Research Topics	2	3	2	1		Faculty of Engineering & Technology	
15	KVTU	517	Optimization in Communications Systems	3	3	2	1		Faculty of Engineering & Technology	
16	KVDV	518	Satellite-based Positioning	3	3	2	1		Faculty of Engineering & Technology	
Specialized Knowledge (select 9/30 credits)					*9*					

17	KVĐT	519	Electromagnetic Compatibility	2	3	2	1		Faculty of Engineering & Technology	
18	KVMM	520	Cryptography and Telecommunications Network Security	2	3	2	1		Faculty of Engineering & Technology	
19	KVVM	521	CMOS Integrated Circuit Design	3	3	2	1		Faculty of Engineering & Technology	
20	KVAT	522	Smart Antennas	3	3	2	1		Faculty of Engineering & Technology	
21	KVQL	523	Information Project Management	3	3	2	1		Faculty of Engineering & Technology	
22	KVNT	524	Artificial Intelligence Technology	3	3	2	1		Faculty of Engineering & Technology	
23	KVIT	525	IoT Systems Topics	3	3	2	1		Faculty of Engineering & Technology	
24	KVQC	526	Advanced Optical Communications	3	3	2	1		Faculty of Engineering & Technology	
25	KVTK	528	ASIC Chip Design Topics	3	3	2	1		Faculty of Engineering & Technology	
26	KVTG	529	Computer Vision and	3	3	2	1		Faculty of Engineering	

			Image Processing						& Technology	
II.3. Practical Internship					6					
27	KVTC	509	Telecommunications Internship 1	3	3	0	3		Faculty of Engineering & Technology	
28	KVTN	510	Telecommunications Internship 2	4	3	0	3		Faculty of Engineering & Technology	
III. Graduation Course (Final Project)					**9**					
29	DATN	527	Master's Project	4	9				Faculty of Engineering & Technology	
Grand Total					**60**					

10. TRAINING SCHEDULE (tentative)

No	Course Code		Course Name	No. credits	Training Schedule *(semester)*				Expected Instructors	Managing Faculty
	Letter	**No.**			1	2	3	4		
I. General Knowledge				**3**						
1	TNTH	501	Philosophy	3	1				As assigned by the managing faculty	DPESM
II. Foundation and Specialized Knowledge				**48**						
II.1. Compulsory				**21**						
2	KVTS	502	Advanced Digital Communications Systems	3	1				Dr. Đao Minh Hung	Faculty of Engineering & Technology
3	KVDĐ	503	Mobile and Wireless Networks	3	1				Dr. Ho Van Phi	Faculty of Engineering & Technology

4	KVXL	504	Spatial-Temporal Signal Processing	3	1				Dr. Đao Minh Hung	Faculty of Engineering & Technology
5	KVTT	505	Information Theory and Coding	3	1				Dr. Đang Thi Tu My	Faculty of Engineering & Technology
6	KVPT	506	Analysis and Design of Wireless Communication Systems	3		2			Dr. Nguyen Đo Dung	Faculty of Engineering & Technology
7	KVPA	507	Numerical Analysis and Design of Antennas	3	1				Dr. Huynh Nguyen Bao Phuong	Faculty of Engineering & Technology
8	KVCĐ	508	Advanced Communication Systems Topics	3		2			Dr. Nguyen Đo Dung	Faculty of Engineering & Technology
*II.2. Elective (*select 7/18 courses)				**21**						
9	KVTP	511	Information Transceiver Systems	3					Dr. Pham Hong Thinh	Faculty of Engineering & Technology
10	KVVT	512	Next-Generation Telecommunications Networks	3					Dr. Ho Van Phi	Faculty of Engineering & Technology
11	KVCB	513	Wireless Sensor Networks	3					Dr. Nguyen Duy Thong	Faculty of Engineering & Technology
12	KVGT	514	Protocols and Networks	3					Dr. Nguyen Duy Thong	Faculty of Engineering & Technology

13	KVCN	515	Industrial Information Systems	3					Dr. Đao Minh Hung	Faculty of Engineering & Technology
14	KVCX	516	Signal Processing Research Topics	3					Dr. Pham Hong Thinh	Faculty of Engineering & Technology
15	KVTU	517	Optimization in Communications Systems	3					Dr. Nguyen Đo Dung	Faculty of Engineering & Technology
16	KVDV	518	Satellite-based Positioning	3					Dr. Le Thi Cam Ha	Faculty of Engineering & Technology
17	KVĐT	519	Electromagnetic Compatibility	3					Dr. Đang Thi Tu My	Faculty of Engineering & Technology
18	KVMM	520	Cryptography and Telecommunications Network Security	3					Dr. Nguyen Tương Thanh	Faculty of Engineering & Technology
19	KVVM	521	CMOS Integrated Circuit Design	3					Dr. Nguyen Van Hao	Faculty of Engineering & Technology
20	KVAT	522	Smart Antennas	3					Dr. Huynh Nguyen Bao Phuong	Faculty of Engineering & Technology
21	KVQL	523	Information Project Management	3					Dr. Huynh Cong Tu	Faculty of Engineering & Technology
22	KVNT	524	Artificial Intelligence Technology	3					Dr. Nguyen Tương Thanh	Faculty of Engineering & Technology

23	KVIT	525	IoT Systems Topics	3					Dr. Nguyen Duy Thong	Faculty of Engineering & Technology
24	KVQC	526	Advanced Optical Communications	3		2			Dr. Le Thi Cam Ha	Faculty of Engineering & Technology
25	KVTK	528	ASIC Chip Design Seminar	3			3		Dr. Nguyen Duy Thong	Faculty of Engineering & Technology
26	KVTG	529	Computer Vision and Image Processing	3			3		Dr. Nguyen Tương Thanh	Faculty of Engineering & Technology
II.3. Practical Internship				**6**						
27	KVTC	509	Telecommunications Internship 1	3			3		Electronics & Telecom Department	Faculty of Engineering & Technology
28	KVTN	510	Telecommunications Internship 2	3				4	Electronics & Telecom Department	Faculty of Engineering & Technology
III. Graduation Final Project				**9**						
29	DATN	527	Master's Project	9				4	Instructors meeting current regulations	Faculty of Engineering & Technology
Grand Total				**60**	**18**	**15**	**15**	**12**		

11. TRAINING PROGRAM IMPLEMENTATION GUIDELINES

- This training program applies starting from the 2025 master's intake for graduate students in Telecommunications Engineering.

- The training process is based on the designed curriculum, training objectives, target audiences, human resource requirements, and specific training demands. For elective courses,

depending on actual development trends and social needs, the faculty managing the major and the course-managing faculty will advise students in selecting appropriate courses.

- The head of the managing faculty is responsible for organizing and guiding the principles for developing the training program, and detailed course syllabi to ensure that objectives, content, and requirements are met while satisfying the needs of learners and society.

- The training program is reviewed, evaluated, and updated in accordance with the current regulations of the Ministry of Education and Training and Quy Nhon University to meet the development needs of master's-level Telecommunications Engineering and align with socio-economic development demands./.

Binh Dinh, December 19, 2024

RECTOR

Assoc. Prof. Dr. Doan Duc Tung