MINISTRY OF EDUCATION AND TRAINING

QUY NHON UNIVERSITY

MASTER'S PROGRAM

Level of education:	**Master's**
Major:	**Elementary Mathematics Methods**
Code:	**8460113**
Training orientation:	**Application-oriented**
Type of education:	**Full-time**

***Binh Dinh*, 2025**

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QUY NHON UNIVERSITY

SOCIALIST REPUBLIC OF VIET NAM
Independence - Freedom - Happiness

MASTER'S PROGRAM

(Issued together with Decision No. 1298/QĐ-ĐHQN dated April 29, 2025 of the Rector of Quy Nhon University)

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1. PROGRAM OBJECTIVES (POs)

1.1. General objectives

The program aims to develop learners who possess strong political qualities and professional ethics; demonstrate solid professional competence and mastery of knowledge in Elementary Mathematics Methods; and have the ability to apply mathematics to solve practical problems arising from mathematics teaching activities at high schools, universities, colleges, and companies. Graduates will also exhibit critical thinking and the capacity for independent, in-depth study and research to acquire new knowledge, and will also be able to pursue doctoral studies.

1.2. Specific objectives

Graduates with a Master's degree in Elementary Mathematics Methods (application-oriented) shall possess the following capabilities:

– Knowledge

+ **PO1:** Acquire solid knowledge of political science and Marxist–Leninist Philosophy in order to apply effectively in professional activities and daily life.

+ **PO2:** Gain extended and advanced knowledge of the fundamental mathematics underlying Elementary Mathematics Methods as a foundation for specialized study and further academic advancement.

+ **PO3:** Possess deep and broad specialized knowledge in several areas of Elementary Mathematics to apply in solving problems arising from mathematics teaching at high schools in accordance with the new general education curriculum.

– Skills

+ **PO4:** Demonstrate the ability to apply advanced mathematical knowledge to solve practical problems arising from the teaching of elementary mathematics.

+ **PO5:** Develop skills in critical thinking, analysis, and synthesis; maintain the capacity for self-study and in-depth research to acquire new knowledge.

+ **PO6:** Demonstrate the ability to work independently, collaborate effectively in teams, and organize teamwork; possess skills in self-study and literature review to identify and solve problems through lifelong learning.

– Autonomy and responsibility

+ **PO7:** Demonstrate self-awareness of the important role of self-study and independent reading in identifying and solving problems, improving professional competence, and pursuing lifelong learning and research.

+ **PO8:** Uphold professional ethics and demonstrate personal and collective responsibility, as well as accountability to the community, society, professional duties, and the environment.

2. EMPLOYMENT OPPORTUNITIES AND FURTHER STUDY PROSPECTS

Graduates of the Application-oriented Master's program in Elementary Mathematics Methods are qualified to:

- **Teaching:** Teach at high schools, middle schools, universities, and colleges nationwide.

- **Industry:** Work at technology companies that require the application of mathematics.

- **Management:** Serve as specialized officers or academic managers at educational and training institutions, as well as education management agencies.

- **Research:** Work as researchers or applied mathematics specialists at research institutes, research centers, universities, and colleges.

- **Doctoral Studies:** Undertake additional academic preparation in order to pursue Doctoral (Ph.D.) programs.

- **International Education:** Continue advanced studies abroad through international postgraduate programs.

3. LEARNING OUTCOMES

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

3.1. Knowledge

- PLO1: Understand and apply knowledge of political science and Marxist–Leninist Philosophy to professional activities and daily life.

- PLO2: Demonstrate broad and in-depth understanding and application of fundamental knowledge in Mathematical Analysis, Algebra, Number Theory, Geometry, Optimization, and Probability in order to pursue specialized study and adapt effectively to frequent changes in the new general education curriculum in Mathematics, teaching, research, and mathematical applications.

- PLO3: Master and demonstrate comprehensive understanding of specialized knowledge in **Elementary Mathematics Methods**; apply such knowledge to solve problems arising in mathematics teaching at high schools in accordance with the new general education curriculum.

- PLO4: Integrate foundational, fundamental, and specialized knowledge acquired during the program with personal knowledge to perform professional activities, including coaching gifted students, teaching specialized mathematics classes, conducting in-depth studies on school mathematics and elementary mathematics, participating in professional development programs and academic seminars for teachers, and developing new knowledge.

3.2. Skills

- PLO5: Apply skills in critical thinking, analysis, synthesis, and evaluation of data and information using scientific and advanced methods; demonstrate effective teamwork skills to accomplish common professional goals.

- PLO6: Apply skills to identify and utilize mathematical knowledge for teaching and conducting in-depth research in school mathematics and elementary mathematics in general.

- **PLO7:** Apply skills in applied mathematical research, innovation, and the use of appropriate technologies in the field of Mathematics.

- PLO8: Apply skills in disseminating mathematical knowledge to students and guiding learners in completing their academic tasks.

3.3. Autonomy and responsibility

- PLO9: Work competently both independently and in teams under changing working conditions; take personal and collective responsibility; and demonstrate the ability to guide and supervise learners in completing academic tasks.

- PLO10: Demonstrate self-orientation and adaptability to changing teaching environments; draw professional conclusions and defend personal viewpoints; possess the ability to plan, coordinate, and manage resources, evaluate and improve the effectiveness of professional activities; and continue academic advancement through self-study or by pursuing Doctoral programs at universities and research institutions both domestically and internationally.

4. ADMISSION REQUIREMENTS

Applicants must meet the following criteria:

- **Academic Qualifications:** Have graduated or be eligible for graduation from a Bachelor's degree program (or an equivalent or higher qualification) in a discipline relevant to Elementary Mathematics Methods.
- **Language Proficiency:** Demonstrate a foreign language proficiency of Level 3 or higher according to the 6-level Foreign Language Proficiency Framework for Vietnam (VSTEP).

List of eligible undergraduate majors

No	Target Master's Major	Eligible Undergraduate Majors	Note
1	Elementary Mathematics Methods	- Mathematics Education (7140209) - Mathematics (7460101) - Applied Mathematics (7460112) - Computational Science (7460107) - Data Science (7460108) - Mathematics and Informatics (7460117) - Mathematics and Mechanics (7460115)	

List of undergraduate majors requiring supplemental knowledge and corresponding courses:

No	Target Master's Major	Majors requiring supplemental knowledge	Supplemental courses (No. of credits)	Note

1	Elementary Mathematics Methods	- Statistics (7460201); - Computer Science Education (7140210) - Other majors: Case-by-case review	- Linear algebra (3 credits) - Abstract algebra (3 credits) - Calculus of Several Variables (3 credits) - Measure Theory and Integration (3 credits) - Functional analysis (3 credits)	Based on the candidate's Bachelor's degree and academic transcripts, the faculty council will review and request the Dean to propose whether the candidate is required to complete supplemental courses and specify the appropriate subjects. Required supplemental courses may be considered for replacement by equivalent certificates issued by reputable educational institutions.

5. ADMISSION TARGETS

In accordance with the current Regulations on Admission and Master's level training issued by Quy Nhon University and the Ministry of Education and Training.

6. PROGRAM DURATION AND TOTAL CREDITS

6.1. Program duration: 2 years

6.2. Total credits: 60 credits, including **6 credits of internship** and **9 credits for the graduation project (Master's project).**

Program structure	Credits
General Knowledge	**3**
Fundamental and specialized knowledge	**48**
Compulsory courses	36
Optional courses	6
Internship	6
Graduation project (Master's project)	**9**
Total	**60**

7. TRAINING METHOD, GRADUATION REQUIREMENTS

7.1. Training method

The program is conducted under a credit-based system, in compliance with the current regulations of the Ministry of Education and Training and Quy Nhon University.

7.2. Graduation Requirements

In accordance with the current Regulations on Admission and Master's level training of Quy Nhon University and the Ministry of Education and Training:

a) Successfully complete all courses in the training program and achieve a passing result in the Master's project defense**;**

b) Meet the foreign language proficiency requirements specified in the program's learning outcomes prior to the time of graduation consideration. This requirement must be evidenced by one of the following:

A diploma or certificate equivalent to Level 4 according to the 6-level Foreign Language Proficiency Framework for Vietnam, as stipulated in the Appendix of the current Regulations on Admission and Master's level training of Quy Nhon University, or other equivalent certificates recognized by the Ministry of Education and Training;

A Bachelor's degree (or higher) in a foreign language major;

A Bachelor's degree (or higher) in another major in which the medium of instruction was entirely in a foreign language.

c) Fulfill all responsibilities in accordance with the regulations of Quy Nhon University; not be under criminal investigation and not be subject to disciplinary action or academic suspension.

7.3. Degree Awarded

Tiếng Việt: BẰNG THẠC SĨ PHƯƠNG PHÁP TOÁN SƠ CẤP

Tiếng Anh: THE DEGREE OF MASTER IN ELEMENTARY MATHEMATICS METHODS

8. ASSESSMENT METHODS, GRADING SCALE

8.1. Grading scale

A 10-point scale is used for all forms of assessment within the course.

8.2. Format, evaluation criteria, and scoring system

- Assessment of theoretical courses

No	Format	Evaluation criteria	Weighting
1	***Progress assessment***	*Attendance:* Students must attend all required sessions and must not miss more than **20%** of the total class hours.	40%
		Discussion: Proactiveness, level of preparation, and active participation in classroom activities.	
		Homework: Students complete one or more assignments at home. Instructors assign specific tasks to individual students or groups of students.	
		Mid-term Assessment: Choose one of the following forms and evaluation criteria: - In-class Test: Students complete a test in class; the instructor will specify the detailed evaluation criteria. - Seminar or Capstone Project: Students conduct a seminar or complete a major assignment (capstone project) as required by the course instructor. Evaluation criteria for reports, seminars, and projects will be specified by the instructor.	
2	***Final examination***	Evaluation criteria are based on the selection of one of the following examination formats: - **Written Examination:** Students complete a final written exam. The instructor will specify the content and evaluation criteria within the answer key and grading scheme of the final exam. - **Oral Examination:** Evaluation criteria are	60%

		determined by the examining board based on the student's attitude and the quality of their responses. - **Term Paper (Essay):** Evaluation criteria are based on the content and quality of the submitted report.	

– Assessment of internship course

50% progress assessment (supervisor); 50% oral examination (the evaluation committee for the oral examination is established by decision of the Department).
Assessment criteria: Specified in detail in the course syllabus.

– Assessment of graduation project (Master's project)

Conducted in accordance with the current Regulations on Admission and Master's Level Training of Quy Nhon University.

8.3. Assessment Methods

The assessment methods used in the Master's program in Elementary Mathematics Methods are categorized into two main types: Formative Assessment (Progress Assessment) and Summative Assessment (Final Assessment). Specific assessment methods are prescribed in the Program Specification for Elementary Mathematics Methods.

The following table provides descriptions of these assessment methods:

Matrix of Assessment Methods and Program Learning Outcomes (PLOs).

Assessment methods	**Program learning outcomes (PLOs)**									
	1	2	3	4	5	6	7	8	9	10
I. Progress assessments										
1. Attendance Assessment									x	x
2. Assignment assessment		x	x	x	x	x	x		x	x
3. Presentation Assessment	x	x	x	x		x		x	x	x
II. Summative assessment										
4. Written examination	x	x	x	x	x	x	x	x	x	x
5. Defense and Oral Examination	x	x	x	x	x	x	x	x	x	x
6. Report	x	x	x	x	x	x	x	x	x	x

9. PROGRAM CONTENT

No	Course Code		Course name	Semester	No. of credits			Prerequisite Course Code	Managing Faculty	Note
	Letter	Number			Total	Theory, Practice	Experimental/ Practical/ Discussional			
I. General knowledge										
I.1. Philosophy										
1	TNTH	501	Philosophy	1	3	3			Faculty of Political Theory, Law, and State Management	
II. Fundamental and specialized knowledge										
II.1. Compulsory										
2	CSBB	502	Advanced linear algebra	1	3	3			Mathematics and Statistics	
3	CSBB	503	Modern algebra	1	3	3			Mathematics and Statistics	
4	CSBB	504	Real analysis	1	3	3			Mathematics and Statistics	
5	CSBB	505	Probability	1	3	3			Mathematics and	

			theory						Statistics	
6	CSBB	506	Introduction to Algebraic geometry	2	3	3			Mathematics and Statistics	
7	CSBB	507	Applied functional analysis	2	3	3			Mathematics and Statistics	
8	CSBB	508	Complex analysis and applications	2	3	3			Mathematics and Statistics	
9	CSBB	509	Optimization theory	2	3	3			Mathematics and Statistics	
10	PPBB	510	Combinatorics and Graph Theory	2	3	3			Mathematics and Statistics	
11	PPBB	511	Elementary Geometry	3	3	3			Mathematics and Statistics	
12	PPBB	512	Inequalities	3	3	3			Mathematics and Statistics	
13	PPBB	513	Number Theory	3	3	3			Mathematics and Statistics	
II.2. Optional (select 03/9 courses)										
14	PPTC	514	Functional Equations	3	2	2			Mathematics and Statistics	
15	PPTC	515	Probabilistic Methods in Combinatorics	3	2	2			Mathematics and Statistics	
16	PPTC	516	Polynomials and Applications	3	2	2			Mathematics and Statistics	

17	PPTC	517	Sequences and Series	3	2	2			Mathematics and Statistics	
18	PPTC	518	Variational Methods in Elementary Mathematics	3	2	2			Mathematics and Statistics	
19	PPTC	519	Finite Differences and Applications	3	2	2			Mathematics and Statistics	
20	PPTC	520	Trigonometry and Applications	3	2	2			Mathematics and Statistics	
21	PPTC	521	Special Functions and Applications	3	2	2			Mathematics and Statistics	
22	PPTC	522	Combinatorial Geometry	3	2	2			Mathematics and Statistics	
II.3. Internship										
23	PPTT	523	Internship 1	3	3		3		Mathematics and Statistics	
24	PPTT	524	Internship 2	4	3		3		Mathematics and Statistics	
III. Master's project										
25	**Master's Project**			4			9		Mathematics and Statistics	
Total					**60**					

Matrix of the Relationship between Courses and Program Learning Outcomes (PLOs)

No	Course code		Course name	Program Learning Outcomes (PLOs)									
	Letter	Number		1	2	3	4	5	6	7	8	9	10
1	TNTH	501	Philosophy	M									

2	CSBB	502	Advanced linear algebra		M	M	M		M	M		M	L
3	CSBB	503	Modern algebra		M	M	M		M	M		M	L
4	CSBB	504	Real analysis		M	M	M		M	M		M	L
5	CSBB	505	Probability theory		M	M	M		M	M		M	L
6	CSBB	506	Introduction to Algebraic geometry		M	M	M		M	M		M	L
7	CSBB	507	Applied functional analysis		M	M	M		M	M		M	L
8	CSBB	508	Complex analysis and applications		M	M	M		M	M		M	L
9	CSBB	509	Optimization theory		M	M	M		M	M		M	L
10	PPBB	510	Combinatorics and Graph Theory		M	H	H		M	M		M	L
11	PPBB	511	Elementary Geometry		M	H	H		M	M		M	L
12	PPBB	512	Inequalities		M	H	H		M	M		M	L
13	PPBB	513	Number Theory		M	H	H		M	M		M	L
14	PPTC	514	Functional Equations		M	H	H		M	M		M	L
15	PPTC	515	Probabilistic Methods in Combinatorics		M	H	H		M	M		M	L
16	PPTC	516	Polynomials and Applications		M	H	H		M	M		M	L
17	PPTC	517	Sequences and Series		M	H	H		M	M		M	L
18	PPTC	518	Variational Methods in Elementary Mathematics		M	H	H		M	M		M	L

19	PPTC	519	Finite Differences and Applications		M	H	H		M	M		M	L
20	PPTC	520	Trigonometry and Applications		M	H	H		M	M		M	L
21	PPTC	521	Special Functions and Applications		M	M	M		M	M		M	L
22	PPTC	522	Combinatorial Geometry		M	H	H		M	M		M	L
23	PPTT	523	Internship 1		H	H	H	M	M	M	M	M	M
24	PPTT	524	Internship 2		H	H	H	M	M	M	M	M	M
25	**Master's project**				H	H	H	M	M	M	M	M	M

10. STUDY PLAN

No	Course code	Course name	No. of credits	Study plan (Semester)				Proposed lecturers	Managing Faculty
				1	2	3	4		
I. General knowledge			**3**	**3**	**0**	**0**	**0**		
1	TNTH501	Philosophy	3	3				Faculty of Political Theory, Law, and State Management	Faculty of Political Theory, Law, and State Management
II. Fundamental and specialized knowledge			**30**	**12**	**15**	**12**	**0**		
II.1. Compulsory			**24**	**12**	**15**	**9**	**0**		
2	CSBB502	Advanced linear algebra	3	3				Dr. Le Thanh Hieu Dr. Tran Dinh Luong	Mathematics and Statistics

3	CSBB503	Modern algebra	3	3				Dr. Pham Thuy Huong Dr. Nguyen Bin	Mathematics and Statistics
4	CSBB504	Real analysis	3	3				Assoc. Prof. Dr. Luong Dang Ky Dr. Mai Thanh Tan Dr. Nguyen Van Thanh Dr. Nguyen Bao Tran	Mathematics and Statistics
5	CSBB505	Probability theory	3	3				Dr. Lam Thi Thanh Tam Dr. Cao Tan Binh Dr. Le Quang Thuan Dr. Nguyen Dang Thien Thu	Mathematics and Statistics
6	CSBB506	Introduction to Algebraic geometry	3		3			Assoc. Prof. Dr. Le Cong Trinh Dr. Pham Thuy Huong Dr. Nguyen Bin	Mathematics and Statistics
7	CSBB507	Applied functional analysis	3		3			Assoc. Prof. Dr. Thai Thuan Quang Assoc. Prof. Dr. Huynh Minh Hien Dr. Nguyen Van Thanh Dr. Nguyen Bao Tran	Mathematics and Statistics
8	CSBB508	Complex analysis and	3		3			Assoc. Prof. Dr. Thai Thuan Quang	Mathematics

		applications						Dr. Nguyen Van Dai Dr. Le Van An Dr. Duong Thanh Vy	and Statistics
9	CSBB509	Optimization theory	3		3			Assoc. Prof. Dr. Sci. Huynh Van Ngai Dr. Nguyen Huu Tron Dr. Nguyen Van Vu Dr. Nguyen Van Thanh	Mathematics and Statistics
10	PPBB510	Combinatorics and Graph Theory	3		3	3		Dr. Lam Thi Thanh Tam Dr. Nguyen Van Vu Assoc. Prof. Dr. Sci. Phan Thi Ha Duong Dr. Tran Nam Dung	Mathematics and Statistics
11	PPBB511	Elementary Geometry	3			3		Dr. Nguyen Ngoc Quoc Thuong Dr. Trinh Dao Chien Dr. Nguyen Bin	Mathematics and Statistics
12	PPBB512	Inequalities	3			3		Prof. Dr. Sci. Nguyen Van Mau Dr. Nguyen Van Thanh Dr. Tran Ngoc Nguyen	Mathematics and Statistics
13	PPBB513	Number Theory	3			3		Dr. Tran Dinh Luong Dr. Nguyen Bin	Mathematics and

									Statistics
II.2. Optional (select 03/9 courses)			**6**	**0**	**0**	**6**	**0**		
14	PPTC514	Functional Equations	2			2		Assoc. Prof. Dr. Le Cong Trinh Prof. Dr. Nguyen Sum Dr. Duong Thanh Vy	Mathematics and Statistics
15	PPTC515	Probabilistic Methods in Combinatorics	2			2		Assoc. Prof. Dr. Sci. Huynh Van Ngai Dr. Le Quang Thuan Dr. Lam Thi Thanh Tam	Mathematics and Statistics
16	PPTC516	Polynomials and Applications	2			2		Dr. Mai Thanh Tan Dr. Nguyen Bao Tran Dr. Nguyen Chu Gia Vuong	Mathematics and Statistics
17	PPTC517	Sequences and Series	2			2		Assoc. Prof. Dr. Huynh Minh Hien Assoc. Prof. Dr. Luong Dang Ky	Mathematics and Statistics
18	PPTC518	Variational Methods in Elementary Mathematics	2			2		Dr. Nguyen Huu Tron Dr. Nguyen Ngoc Quoc Thuong Dr. Nguyen Van Vu Dr. Nguyen Van Thanh	Mathematics and Statistics
19	PPTC519	Finite Differences	2			2		Dr. Hoang Van Duc	Mathem

		and Applications						Assoc. Prof. Dr. Phan Thanh Nam	atics and Statistics
20	PPTC520	Trigonometry and Applications	2			2		Dr. Nguyen Ngoc Quoc Thuong Dr. Mai Thanh Tan	Mathematics and Statistics
21	PPTC521	Special Functions and Applications	2			2		Assoc. Prof. Dr. Dinh Thanh Duc Dr. Le Quang Thuan Dr. Nguyen Tong Xuan	Mathematics and Statistics
22	PPTC522	Combinatorial Geometry	2			2		Assoc. Prof. Dr. Le Cong Trinh Dr. Nguyen Bin	Mathematics and Statistics
II.3. Internship			**6**	**0**	**0**	**3**	**3**		
23	PPTT523	Internship 1				3		Based on the specializations of the Department of Mathematics and Statistics	Mathematics and Statistics
24	PPTT524	Internship 2					3	Based on the specializations of the Department of Mathematics and Statistics	Mathematics and Statistics
IV. Master's Project			**9**				**9**		Mathem

							atics and Statistics
Total:	**60**	**15**	**15**	**18**	**12**		

11. GUIDELINES FOR PROGRAM IMPLEMENTATION

- Applicability: This training program is applied to Master's students majoring in Elementary Mathematics Methods (Application-oriented curriculum) at Quy Nhon University, starting from the 2025 intake**.**

- Online Instruction: Certain courses within the program may be delivered via online learning, provided that they do not exceed 30% of the total program workload and are proposed by the Managing Faculty**.**

- Training Process: The training process is based on the designed curriculum, educational objectives, target learners, human resource requirements, and specific training needs. For elective courses, depending on current development trends and societal demands, the Managing Faculty will advise students on selecting appropriate modules.

- Management Responsibility: The Dean of the Managing Faculty is responsible for organizing and guiding the principles for program development and detailed course syllabi to ensure that the objectives, content, and requirements are fulfilled, while also meeting the needs of learners and society.

- Program Review and Update: The training program shall be reviewed, evaluated, and updated in accordance with the current regulations of the Ministry of Education and Training and Quy Nhon University, ensuring that the program keeps pace with developments in Elementary Mathematics Methods and meets socio-economic development needs.

Binh Dinh, April 29, 2025

RECTOR

Assoc. Prof. Dr. Doan Duc Tung