MINISTRY OF EDUCATION AND TRAINING

QUY NHON UNIVERSITY

DOCTORAL PROGRAM

Major**: Mathematical Analysis**
Code: **9460102**
Type of education: **Full-time**

Binh Dinh, 2023

MINISTRY OF EDUCATION AND TRAINING
QUY NHON UNIVERSITY

SOCIALIST REPUBLIC OF VIET NAM
Independence - Freedom – Happiness

DOCTORAL PROGRAM

(Issued together with Decision No. 2018/QĐ-ĐHQN dated July 31, 2023

of the Rector of Quy Nhon University)

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1. EDUCATIONAL OBJECTIVES

1.1. General Objective

The doctoral program aims to train graduates who possess strong political qualities, ethical standards, professional responsibility, and a commitment to serving the community. Graduates are expected to acquire fundamental, core, and advanced theoretical knowledge as well as in-depth and applied knowledge in Mathematics in general and Mathematical Analysis in particular. They will develop research skills and the ability to view mathematical problems comprehensively, conduct independent and creative research, generate new knowledge, and identify and solve emerging problems in practice.

In addition, graduates will be capable of proposing and organizing scientific and technological research, leading professional activities in the field of Mathematical Analysis, and effectively meeting the requirements of teaching, scientific research, and academic management. The program also aims to provide highly qualified human resources for scientific research, national development, and international integration.

1.2. Specific Objectives

Graduates of the research-oriented Master's program in Mathematical Analysis are expected to achieve the following:

- **Knowledge**

+ **PO1:** Possess solid knowledge of political science and demonstrate strong political qualities, ethical standards, professional responsibility, and a commitment to serving the community.

+ **PO2:** Possess fundamental, core, and advanced knowledge, including modern and specialized theoretical and applied knowledge in Mathematics in general and Mathematical Analysis in particular.

+ **PO3:** Possess knowledge of organizational governance and the management and administration of professional activities in research and development in Mathematics in general and Mathematical Analysis in particular.

- **Skills**

+ **PO4:** Demonstrate the ability to master scientific theories, methods, and tools necessary for conducting research and developing new knowledge in Mathematics in general and Mathematical Analysis in particular, as well as the ability to apply analytical reasoning and synthesis to creatively solve practical problems in Mathematical Analysis.

+ **PO5:** Possess critical thinking, analytical, and synthesis skills, as well as the ability for self-learning and advanced research to acquire new knowledge; demonstrate the ability to formulate problems and solve them independently; engage in lifelong learning and research.

+ **PO6:** Demonstrate the ability to work independently and collaboratively in teams; possess skills in professional management and leadership of research groups in Mathematical Analysis, participate in academic discussions and dissemination of research results, and supervise research activities in the discipline.

- **Autonomy and Responsibility**

+ **PO7:** Be self-aware of the importance of independent learning and academic inquiry in identifying and solving problems; continuously improve professional qualifications and engage in lifelong learning and research.

+ **PO8:** Demonstrate professional ethics, personal and team responsibility, and accountability to the community and society, as well as responsibility toward professional duties and the working environment.

2. EMPLOYMENT OPPORTUNITIES AND FURTHER STUDY ROSPECTS

Doctoral graduates from the **Mathematical Analysis** program may:

- Teach at universities and colleges nationwide;
- Work as academic administrators at educational institutions and education management agencies;

- Work as research staff in mathematics institutes, research centers, and universities or colleges;
- Continue their academic development through postdoctoral research programs.

3. PROGRAM LEARNING OUTCOMES (PLOs)

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

3.1. Knowledge

- General and Fundamental Knowledge

1) PLO1: Understand and apply knowledge of political science and the fundamental and core foundations of mathematics, and apply them in professional activities and daily life.

- Specialized Knowledge of the Discipline

2) PLO2: Evaluate modern, advanced, and specialized theories in Mathematical Analysis and assess the applicability of mathematics in general, and mathematical analysis in particular, in various fields of science and technology.

3) PLO3: Analyze scientific problems in the field of Mathematical Analysis and propose expert-level solutions to specific situations.

4) PLO4: Apply core and fundamental knowledge as well as advanced and specialized theories to manage, organize, and administer professional activities in teaching, scientific research, and practical applications related to Mathematical Analysis.

3.2. Skills

- General Skills

5) PLO5: Demonstrate and apply skills in critical thinking, analysis, synthesis, and scientific evaluation of data and information; possess teamwork skills to accomplish common professional objectives.

- Professional Skills

6) PLO6: Proficiently apply scientific theories, methods, and tools to conduct research and development in the field of Mathematical Analysis.

7) PLO7: Update, synthesize, and analyze scientific issues; flexibly apply research findings and creatively solve problems in research related to Mathematical Analysis, as well as address practical problems.

8) **PLO8:** Organize and manage professional activities and research groups in the field of **Mathematical Analysis**; participate in academic discussions, consultation, policy critique, and publication of research results; demonstrate proficiency and creativity in disseminating mathematical knowledge.

3.3. Autonomy and Responsibility

9) **PLO9:** Apply knowledge of Mathematical Analysis to generate new ideas and knowledge in various contexts; demonstrate the ability to self-direct and lead others in scientific research and teaching; manage research activities and take responsibility for continuous professional learning and knowledge development; possess the ability to collaborate and communicate academically with domestic and international research groups (with foreign language proficiency equivalent to B2 level of the Common European Framework of Reference for Languages – CEFR); and be able to use computers to support research.

10) **PLO10:** Demonstrate the ability to adapt to changing research environments, draw professional conclusions, and defend personal viewpoints; continue professional development through self-study or postdoctoral programs at universities and research institutions both domestically and internationally; uphold academic integrity and responsibility in scientific research; and continuously update knowledge and demonstrate creativity in professional work.

4. ADMISSION REQUIREMENTS

- Applicants must hold a master's degree or have completed a specialized in-depth training program at Level 7 in a relevant field, or hold a bachelor's degree with excellent classification (or an equivalent or higher qualification) in a relevant field; and possess research capacity and experience**.**
- Applicants must have foreign language proficiency at Level 4 according to the Vietnamese 6-Level Foreign Language Proficiency Framework (or an equivalent or higher level).

+ Applicants holding a master's degree in a relevant field:

No	Intended Doctoral Major	Master's Degree Major	Note
1	Mathematical Analysis	Mathematical Analysis (8460102)	**Category 1:** No Supplementary Coursework Required
		Applied Mathematics (8460112)	
		Probability Theory and Mathematical Statistics. (8460106)	
		Algebra and Number Theory (8460104)	
		Geometry and Topology (8460105)	

		Mathematical Foundations for Computer Science (8460110)	**Category 2:** Supplementary Coursework (4 credits)
		Methods in Elementary Mathematics (8460113)	
		Data Science (8904648)	

Note: The supplementary courses required for Category 2 will be determined by the Academic Council of the Department of Mathematics and Statistics for each candidate, based on the recommendation of the supervisory faculty team**,** selected from the **ELECTIVE** items in the list of supplementary courses or from the doctoral-level courses**.**

+ Applicants holding an excellent bachelor's degree in the relevant field are required to complete supplementary coursework.

No	Intended Doctoral Major	Bachelor's Degree Major (Excellent Classification) Requiring Supplementary Coursework		Supplementary Courses	Note
		Program Name,	Program Code		
1	Mathematical Analysis	- Mathematics Education - Mathematics - Applied Mathematics - Mathematics and Mechanics - Mathematics and Computer Science - Computational Science - Data Science	7140209 7460101 7460112 7460115 7460117 7460107 7460108	- **Foundational Courses:** 16 credits - Compulsory: 10 credits - Optional: 6 credits - **Specialized Courses:** 14 credits - Compulsory: 8 credits - Optional: 6 credits	**Category 3**

5. ADMISSION APPLICANTS

In accordance with the current Regulations on Admission and Training for Doctoral Programs issued by the Ministry of Education and Training and Quy Nhon University. Specifically, this includes Categories 1, 2, and 3 as stated in Section 4.

6. PROGRAM DURATION AND TOTAL CREDIT REQUIREMENTS

6.1. Program Duration: From 03 years (36 months) to 04 years (48 months)

6.2. Total Credit Requirements:

Curriculum Structure	Number of Credits
Supplementary Courses	**30**
Fundamental Knowledge	**16**
Compulsory courses	10
Optional courses	6
Specialized Knowledge	**14**
Compulsory courses	4
Optional courses	10
Doctoral-Level Courses (including required courses, elective courses, doctoral seminars, and the literature review)	**15**
Doctoral-level Courses	**9**
Compulsory courses	3
Optional courses	6
Doctoral Seminars	**4**
Compulsory courses	2
Optional courses	2
Literature Review	**2**
Scientific Research and Doctoral Dissertation	**75**
Total	
Doctoral candidates with a master's degree (Category 1)	**90**
Doctoral candidates with a master's degree (Category 2)	**94**
Doctoral candidates with a bachelor's degree (Category 3)	**120**

7. TRAINING METHOD AND GRADUATION REQUIREMENTS

7.1. Training Method

The program is conducted under the **credit-based system** and complies with the current **regulations and rules** of the **Ministry of Education and Training** and **Quy Nhon University**.

7.2. Recognition of Qualification and Award of the Doctoral Degree

Doctoral candidates shall be considered for the **recognition of the doctoral qualification and the award of the doctoral degree** when they satisfy the following requirements:

a) The candidate's doctoral dissertation has been approved by the University-level Doctoral Dissertation Evaluation Committee;

b) The candidate has submitted to the University (both printed and electronic versions) the final completed dissertation bearing the candidate's signature, the supervisor's confirmation, and the confirmation of the Chair of the Dissertation Evaluation Committee after all required revisions and additions (if any) have been completed;

c) The candidate has submitted to the Vietnam National Library (both electronic and printed versions) the dissertation abstract and the final complete dissertation, bearing the candidate's signature, the supervisor's signature, and the University's confirmation.

8. ASSESSMENT METHODS AND GRADING SCALE

8.1. Grading Scale

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

8.2. Assessment Forms, Criteria, and Weighting

These are implemented in accordance with the current Regulations on Admission and Training for Doctoral Programs issued by the Ministry of Education and Training and Quy Nhon University. Specific criteria are detailed in the description of each course.

8.3. Assessment Methods

These are implemented in accordance with the current Regulations on Admission and Training for Doctoral Programs issued by the Ministry of Education and Training and Quy Nhon University. Specific criteria are detailed in the description of each course.

9. PROGRAM CONTENT

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
I. Supplementary courses					**30**						
I.1 Fundamental knowledge					**16**						
Compulsory					**10**						
1	CSBB	502	Topology	1	2					Maths and Statistics	
2	CSBB	503	Functional Analysis	1	3				CSBB 502	Maths and Statistics	
3	CSBB	505	Algebra 1	1	3					Maths and Statistics	
4	CSBB	506	Algebra 2	1	2				CSBB 505	Maths and Statistics	
Optional (select 2 courses)					**6**						
5	GTTC	501	Complex Analysis with Applications	1	2				CSBB 502	Maths and Statistics	
6	GTTC	502	Probability Theory	1	2					Maths and	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/Practical			
										Statistics	
7	GTTC	503	Probability Theory	1	2					Maths and Statistics	
8	GTTC	504	Probability Theory	1	2					Maths and Statistics	
9	GTTC	505	Probability Theory	1	2				CSBB 503	Maths and Statistics	
10	GTTC	506	Probability Theory	1	2					Maths and Statistics	
11	GTTC	507	Convex Analysis	1	2					Maths and Statistics	
I.2 Specialized Knowledge					**14**						
Compulsory					**4**						
1	GTBB	501	Topological Vector Spaces	1	2				CSBB 503	Maths and Statistics	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/Practical			
2	GTBB	502	Optimization Theory	1	2					Maths and Statistics	
Optional *(select 5 courses)*					**10**						
3	GTTC	508	Theory of Extremal Problems	1	2				GTBB 502	Maths and Statistics	
4	GTTC	509	Integral Transforms	1	2					Maths and Statistics	
5	GTTC	510	Theory of Distributions	1	2					Maths and Statistics	
6	GTTC	511	Operator Theory	1	2				CSBB 503	Maths and Statistics	
7	GTTC	512	Variational Analysis	1	2					Maths and Statistics	
8	GTTC	513	Mathematical Control Theory	1	2					Maths and	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/Practical			
										Statistics	
9	GTTC	514	Complex Analysis on Banach Spaces	1	2				CSBB 503 GTTC 501	Maths and Statistics	
10	GTTC	515	Fourier Analysis	1	2				CSBB 503	Maths and Statistics	
11	GTTC	516	Mathematical Statistics	1	2				GTTC 502	Maths and Statistics	
12	GTTC	517	Optimal Control Theory	1	2					Maths and Statistics	
13	GTTC	518	Theory of Hyperbolic Dynamical Systems	1	2				GTTC 517	Maths and Statistics	
14	GTTC	519	Difference Equations and Applications	1	2				CSBB 503	Maths and Statistics	
II. Doctoral-level courses					**15**						

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
II.1. Compulsory					**3**						
1	GTBB	801	Advanced Functional Analysis	2	3				CSBB 503	Maths and Statistics	
II.2. Optional (Select 2 course)					**6**						
2	GTTC	801	Convex Analysis	2	3					Maths and Statistics	
3	GTTC	802	Advanced Measure Theory and Integration.	2	3				CSBB 503	Maths and Statistics	
4	GTTC	803	Complex Analysis in Locally Convex Spaces	2	3				GTBB 501 GTTC 514	Maths and Statistics	
5	GTTC	804	Several Complex Variables	2	3				GTBB 501	Maths and Statistics	
6	GTTC	805	Integral Transforms	2	3					Maths and Statistics	
7	GTTC	806	Difference Equations	2	3				CSBB	Maths and	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/Practical			
									503	Statistics	
8	GTTC	807	Mathematical Control Theory	2	3				GTTC 513	Maths and Statistics	
9	GTTC	808	Set-Valued Analysis	2	3					Maths and Statistics	
10	GTTC	809	Inequalities and Applications	2	3					Maths and Statistics	
11	GTTC	810	Matrix Analysis	2	3				CSBB 503	Maths and Statistics	
12	GTTC	811	Harmonic Analysis	2	3				CSBB 503	Maths and Statistics	
13	GTTC	812	Advanced Operator Theory	2	3				GTTC 511	Maths and Statistics	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
14	GTTC	813	Convex Functions and Applications	2	3				GTTC 812	Maths and Statistics	
15	GTTC	814	Quantum Information Theory	2	3				GTTC 810	Maths and Statistics	
III. Doctoral topics *(Select 2 courses)*					**4**						
1	GTCĐ	801	Nuclear Locally Convex Spaces	3	2				GTBB 501	Maths and Statistics	
2	GTCĐ	802	Inequalities: Majorization Theory and Applications	3	2				GTTC 812 GTTC 813	Maths and Statistics	
3	GTCĐ	803	Extremal Plurisubharmonic Functions in C^n	3	2				GTTC 814	Maths and Statistics	
4	GTCĐ	804	Potential Theory in the Complex Plane	3	2				GTTC 501	Maths and Statistics	
5	GTCĐ	805	Mond–Pečarić Method in	3	2				GTCĐ 802	Maths and	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
			Operator Inequalities							Statistics	
6	GTCĐ	806	Reproducing Kernel Theory and Applications	3	2					Maths and Statistics	
7	GTCĐ	807	Norm Inequalities and Applications	3	2				GTTC 805	Maths and Statistics	
8	GTCĐ	808	Measure and Integration on Time Scales	3	2				GTTC 802	Maths and Statistics	
9	GTCĐ	809	Oscillation Theory of Dynamic Equations on Time Scales	3	2				GTCĐ 808	Maths and Statistics	
10	GTCĐ	810	Geometric Theory of Nonautonomous Discrete Dynamical Systems	3	2				GTTC 503	Maths and Statistics	
11	GTCĐ	811	Stability Theory of Switched Systems	3	2				GTTC 807	Maths and Statistics	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
12	GTCĐ	812	Control of Functional Differential Systems	3	2				GTTC 807	Maths and Statistics	
13	GTCĐ	813	State Function Estimation	3	2					Maths and Statistics	
14	GTCĐ	814	Variational Analysis and Applications	3	2					Maths and Statistics	
15	GTCĐ	815	Pluripotential Theory	3	2				GTCĐ 803	Maths and Statistics	
16	GTCĐ	816	Multidimensional Integral Transforms	3	2				GTTC 805	Maths and Statistics	
17	GTCĐ	817	Integral Transforms and Applications	3	2				GTCĐ 807	Maths and Statistics	
18	GTCĐ	818	Pluripotential Theory	3	2				GTTC 510 GTTC 810	Maths and Statistics	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/Practical			
19	GTCĐ	819	Multidimensional Integral Transforms	3	2				GTTC 810 GTCĐ 818	Maths and Statistics	
20	GTCĐ	820	Integral Transforms and Applications	3	2				CSBB 503 GTTC 811	Maths and Statistics	
21	GTCĐ	821	Pluripotential Theory	3	2				GTTC 811	Maths and Statistics	
22	GTCĐ	822	Multidimensional Integral Transforms	3	2				GTTC 807	Maths and Statistics	
23	GTCĐ	823	Metric Regularity Theory and Applications	3	2				CSBB 503	Maths and Statistics	
24	GTCĐ	824	Theory of Controllability.	3	2					Maths and Statistics	
25	GTCĐ	825	Some Quantum Distance Measures and Divergences	3	2				GTTC 814	Maths and Statistics	

No	Course code		Course name	Year	No. of credits				Prerequisite Course Code	Managing faculty	Note
	Letters	Numbers			Total	Theoretical	Assignment	Experimental/ Practical			
26	GTCĐ	826	Quantum Fidelity	3	2				GTTC 814	Maths and Statistics	
24	GTTL	801	Literature review essay	2	**2**					Maths and Statistics	
IV. Scientific research and Doctoral Dissertation					**75**						
Total											
PhD Candidates with a Master's Degree (Category 1)					**90**						
PhD Candidates with a Master's Degree (Category 2)					**94**						
PhD Candidates with a Bachelor's Degree (Category 3)					**120**						

10. TENTATIVE TEACHING PLAN

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
I. Supplementary courses								
I.1	**Fundamental knowledge**							
Compulsory								

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
1	**CSBB 502**	Topology	2	x				Huỳnh Minh Hiền Mai Thành Tấn
2	CSBB 503	Functional Analysis	3	x				Thái Thuần Quang Nguyễn Văn Đại
3	CSBB 505	Algebra 1	3	x				Lê Thanh Hiếu
3	CSBB 506	Algebra 2	2	x				Lê Thanh Hiếu
Optional								
5	GTTC 501	Complex Analysis with Applications	2	x				Thái Thuần Quang Nguyễn Văn Đại Dương Thanh Vỹ
6	GTTC 502	Probability Theory	2	x				Lâm Thị Thanh Tâm Lê Thanh Bính Nguyễn Đặng Thiên Thư
7	GTTC 503	Probability Theory	2	x				Nguyễn Ngọc Quốc Thương Đinh Thanh Đức
8	GTTC 504	Probability Theory	2	x				Huỳnh Văn Ngãi Nguyễn Hữu Trọn
9	GTTC 505	Probability Theory	2	x				Thái Thuần Quang Mai Thành Tấn
10	GTTC 506	Probability Theory	2	x				Đinh Thanh Đức Lê Quang Thuận Nguyễn Tòng Xuân

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
11	GTTC 507	Convex Analysis	2	x				Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
I.2	**Specialized Knowledge**							
Compulsory								
1	GTBB 501	Topological Vector Spaces	2	x				Thái Thuần Quang Huỳnh Minh Hiền
2	GTBB 502	Optimization Theory	2	x				Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
Optional								
3	GTTC 508	Variational Analysis	2	x				Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
4	GTTC 509	Mathematical Control Theory	2	x				Đinh Thanh Đức Lê Quang Thuận Nguyễn Tòng Xuân
5	GTTC 510	Complex Analysis on Banach Spaces	2	x				Đinh Thanh Đức Lê Quang Thuận Nguyễn Văn Thành
6	GTTC 511	Fourier Analysis	2	x				Lương Đăng Kỳ Thái Thuần Quang
7	GTTC 512	Mathematical Statistics	2	x				Nguyễn Hữu Trọn Nguyễn Văn Vũ

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
8	GTTC 513	Optimal Control Theory	2	x				Phan Thanh Nam Lê Quang Thuận Nguyễn Văn Thành
9	GTTC 514	Theory of Hyperbolic Dynamical Systems	2	x				Thái Thuần Quang Nguyễn Văn Đại Dương Thanh Vỹ
10	GTTC 515	Difference Equations and Applications	2	x				Lương Đăng Kỳ Trần Ngọc Nguyên Nguyễn Bảo Trân
11	GTTC 516	Variational Analysis	2	x				Lâm Thị Thanh Tâm Lê Thanh Bính Nguyễn Đặng Thiên Thư
12	GTTC 517	Mathematical Control Theory	2	x				Lê Quang Thuận Nguyễn Văn Thành Huỳnh Văn Ngãi
13	GTTC 518	Complex Analysis on Banach Spaces	2	x				Huỳnh Minh Hiền
14	GTTC 519	Fourier Analysis	2	x				Phan Thanh Nam
II. Doctoral-level courses								
II.1. Compulsory								
1	GTBB 801	Advanced Functional Analysis	3		x			Thái Thuần Quang Huỳnh Minh Hiền Nguyễn Ngọc Quốc Thương
II.2. Optional								

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
2	GTTC 801	Convex Analysis	3		x			Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
3	GTTC 802	Advanced Measure Theory and Integration.	3		x			Lương Đăng Kỳ Trần Ngọc Nguyên Nguyễn Bảo Trân
4	GTTC 803	Complex Analysis in Locally Convex Spaces	3		x			Thái Thuần Quang Lê Văn An
5	GTTC 804	Several Complex Variables	3		x			Thái Thuần Quang Lê Văn An
6	GTTC 805	Integral Transforms	3		x			Đinh Thanh Đức Lê Quang Thuận Nguyễn Tòng Xuân
7	GTTC 806	Difference Equations	3		x			Phan Thanh Nam
8	GTTC 807	Mathematical Control Theory	3		x			Phan Thanh Nam Lê Quang Thuận Nguyễn Văn Thành
9	GTTC 808	Set-Valued Analysis	3		x			Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
10	GTTC 809	Inequalities and Applications	3		x			Đinh Thanh Đức Lê Quang Thuận Trần Ngọc Nguyên Dương Thanh Vỹ

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
11	GTTC 810	Matrix Analysis	3		x			Lê Quang Thuận Dương Thanh Vỹ Nguyễn Ngọc Quốc Thương
12	GTTC 811	Harmonic Analysis	3		x			Lương Đăng Kỳ Lê Văn An
13	GTTC 812	Advanced Operator Theory	3		x			Thái Thuần Quang Lê Văn An Huỳnh Minh Hiền
14	GTTC 813	Convex Functions and Applications	3		x			Thái Thuần Quang Đinh Thanh Đức Lê Quang Thuận
16	GTTC 814	Quantum Information Theory						Lê Công Trình
III. Doctoral topics								
1	GTCĐ 801	Nuclear Locally Convex Spaces	2			x		Thái Thuần Quang
2	GTCĐ 802	Inequalities: Majorization Theory and Applications	2			x		Thái Thuần Quang Đinh Thanh Đức Lê Quang Thuận
3	GTCĐ 803	Extremal Plurisubharmonic Functions in C^n	2			x		Thái Thuần Quang Nguyễn Văn Đại Dương Thạnh Vỹ
4	GTCĐ 804	Potential Theory in the Complex Plane	2			x		Thái Thuần Quang Nguyễn Văn Đại Dương Thạnh Vỹ

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
5	GTCĐ 805	Mond–Pečarić Method in Operator Inequalities	2			x		Thái Thuần Quang Đinh Thanh Đức Lê Quang Thuận
6	GTCĐ 806	Reproducing Kernel Theory and Applications	2			x		Đinh Thanh Đức Lê Quang Thuận Trần Ngọc Nguyên
7	GTCĐ 807	Norm Inequalities and Applications	2			x		Đinh Thanh Đức Lê Quang Thuận Dương Thạnh Vỹ
8	GTCĐ 808	Measure and Integration on Time Scales	2			x		Huỳnh Minh Hiền Phan Thanh Nam Nguyễn Ngọc Quốc Thương
9	GTCĐ 809	Oscillation Theory of Dynamic Equations on Time Scales	2			x		Huỳnh Minh Hiền Phan Thanh Nam Nguyễn Ngọc Quốc Thương
10	GTCĐ 810	Geometric Theory of Nonautonomous Discrete Dynamical Systems	2			x		Huỳnh Minh Hiền Phan Thanh Nam Nguyễn Ngọc Quốc Thương
11	GTCĐ 811	Stability Theory of Switched Systems	2			x		Huỳnh Minh Hiền Phan Thanh Nam Nguyễn Bảo Trân
12	GTCĐ 812	Control of Functional Differential Systems	2			x		Lê Quang Thuận Huỳnh Minh Hiền Trần Ngọc Nguyên

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
13	GTCĐ 813	State Function Estimation	2			x		Phan Thanh Nam Lê Quang Thuận Nguyễn Bảo Trân
14	GTCĐ 814	Variational Analysis and Applications	2			x		Nguyễn Hữu Trọn Nguyễn Văn Vũ Hoàng Văn Đức
15	GTCĐ 815	Pluripotential Theory	2			x		Thái Thuần Quang Nguyễn Văn Đại Dương Thạnh Vỹ
16	GTCĐ 816	Multidimensional Integral Transforms	2			x		Đinh Thanh Đức Lê Quang Thuận Nguyễn Tòng Xuân
17	GTCĐ 817	Integral Transforms and Applications	2			x		Đinh Thanh Đức Lê Quang Thuận Nguyễn Bảo Trân
18	GTCĐ 818	Pluripotential Theory	2			x		Lê Công Trình Nguyễn Bảo Trân Nguyễn Tòng Xuân
19	GTCĐ 819	Multidimensional Integral Transforms	2			x		Lê Công Trình Nguyễn Bảo Trân Nguyễn Tòng Xuân
20	GTCĐ 820	Integral Transforms and Applications	2			x		Lương Đăng Kỳ Lê Văn An
21	GTCĐ 821	Pluripotential Theory	2			x		Lương Đăng Kỳ Lê Văn An

No	Course code	Course name	No. of credits	Tentative teaching plan *(year)*				Proposed lecturers
				1	2	3	4	
22	GTCĐ 822	Multidimensional Integral Transforms	2			x		Lê Quang Thuận Nguyễn Văn Thành
23	GTCĐ 823	Metric Regularity Theory and Applications	2			x		Huỳnh Văn Ngãi Nguyễn Hữu Trọn Nguyễn Văn Vũ
24	GTCĐ 824	Theory of Controllability.	2			x		Lê Quang Thuận Phan Thanh Nam
25	GTCĐ 825	Some Quantum Distance Measures and Divergences	2			x		Lê Công Trình Lê Thanh Hiếu
26	GTCĐ 826	Quantum Fidelity	2			x		Lê Công Trình Lê Thanh Hiếu
27	GTTL 801	Literature review essay	2			x		**Supervisors**
III. Scientific research and Doctoral Dissertation			**75**	**x**	**x**	**x**	**x**	**Supervisors**

11. DETAILED COURSE OUTLINES (APPENDIX)

12. GUIDELINES FOR IMPLEMENTING THE TRAINING PROGRAM

- This training program is applied starting from the 2023 admission cycle**.**
- The training process is based on the designed curriculum, training objectives, target learners, human resource requirements, and specific requirements for the training program. For elective courses**,** depending on the actual development trends and social demands, the faculty in charge of academic management will advise students on selecting appropriate courses.
- The Dean of the faculty responsible for academic management is in charge of organizing and guiding the principles for developing detailed course syllabi to ensure that the objectives, contents, and requirements are met, while also satisfying the needs of learners and society.

- The training program will be reviewed and updated in accordance with current regulations to meet the development of the field of Mathematical Analysis and align with the needs of socio-economic development**.**

Binh Dinh, July 31, 2023

RECTOR

Assoc. Prof. Dr. Do Ngoc My