MINISTRY OF EDUCATION AND TRAINING
QUY NHON UNIVERSITY

MASTER'S PROGRAM

Level of education: **Master's**
Major: **Experimental biology**
Code: **8420114**
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.485/QĐ-ĐHQN dated February 14, 2025 of the Rector of Quy Nhon University)

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Major: **Experimental biology**

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1. PROGRAM OBJECTIVES (POs)

1.1. General objectives

The goal is to train graduate students with strong political and professional ethics, in-depth specialized knowledge in biology, and the ability to engage in self-directed learning and conduct independent research in experimental biology. Graduate should possess strong problem-solving and collaborative skills for work at educational and training institutions, research institutes, and other facilities related to experimental biology. They are also expected to demonstrate practical professional skills, the ability to apply research results to practical production, creativity and professional responsibility, adaptability to the work environment, as well as a strong sense of social responsibility and community service.

1.2. **Specific objectives** (POs)

- Knowledge:

PO1: Demonstrate an understanding of, and the ability to apply, fundamental knowledge of philosophy, scientific research methodology, modern biological foundations, and advanced theoretical issues in the field of Experimental biology to support research activities and lifelong professional development.

PO2: Possess in-depth and up-to-date knowledge in biology to meet the requirements of professional work and research in Experimental biology, and apply biological knowledge to practical production.

- Skills

PO3: Demonstrate the ability to use scientific equipment and technological tools to address scientific, technological, and practical problems in the research and application of Experimental biology.

PO4: Demonstrate the ability to analyze problems (including identifying approaches, defining objectives, and determining solutions) and to design and implement appropriate research plans (including selecting research topics, scope, content, and methods) in the field of Experimental biology.

PO5: Demonstrate the ability to work independently in implementing, testing, and evaluating new solutions, initiatives, and techniques in Experimental biology.

PO6: Demonstrate proficiency in the use of English and information technology for professional purposes.

- Autonomy and Responsibility

PO7: Demonstrate the ability to apply research results in practice, adapt to changing professional environments, guide others in performing tasks, and manage, evaluate, and continuously improve professional performance.

PO8: Demonstrate strong political integrity and professional ethical standards in professional practice.

2. EMPLOYMENT OPPORTUNITIES AND FURTHER STUDY PROSPECTS

Upon graduation, students are awarded a Master's degree in Experimental biology and are qualified to undertake various professional roles in organizations, agencies, and enterprises, including:

- Teaching and training at universities, colleges, vocational institutions, and high schools.

- Conducting applied research and transferring research outcomes into practice in the fields of agriculture, environment, biotechnology, and aquaculture at research stations, farms, centers, institutes, and enterprises related to biology, agriculture, aquaculture, seafood processing, forestry, and environmental management.

- Performing technical tasks, managing technological processes, and conducting quality control in biotechnology production units.

- Working in governmental and regulatory agencies responsible for the management and supervision of biologically derived products, such as Departments of Science and Technology, Departments of Health, Preventive Medicine Centers, Departments of Natural Resources and Environment, environmental consulting and management centers, Departments of Agriculture, seed management and distribution centers, and plant protection sub-departments.

- Holding managerial positions in enterprises operating in the fields of biology, agriculture, aquaculture, seafood processing, forestry, and environmental services.

- Pursuing doctoral studies.

3. LEARNING OUTCOMES

Program Learning Outcomes (PLOs):

3.1. Knowledge

PLO1: Critically apply fundamental philosophical knowledge to analyze and interpret research results in the Experimental biology.

PLO2: Analyze and evaluate specialized theories to design and implement solutions in teaching and research within the Experimental biology.

PLO3: Apply specialized knowledge, research methodologies, and operational principles of equipment, machinery, and software to plan, organize, and guide professional

activities in the Experimental biology.

3.2. Skills

PLO4: Apply foreign language skills to read, write, and present scientific reports related to the Natural Sciences, achieving Level 4 or higher according to the 6-level Foreign Language Proficiency Framework for Vietnam (Circular 23/2021/TT-BGDĐT).

PLO5: Collaborate effectively with colleagues and experts to achieve research and teaching objectives in the Experimental biology.

PLO6: Demonstrate self-directed learning and advanced research skills, including collecting, synthesizing, and analyzing data; writing scientific reports; and organizing, coordinating, and directing teaching and research activities in the Experimental biology.

3.3. Autonomy and Responsibility

PLO7: Create and propose innovative initiatives in professional training and provide evidence-based recommendations and solutions to complex problems in the Natural Sciences.

PLO8: Evaluate and uphold the integrity of scientific knowledge and professional research outcomes, demonstrating responsibility to both the collective and the broader community.

4. ENTRY REQUIREMENTS

- Hold a university degree, a university graduation certificate, or a temporary university graduation certificate in a field relevant to the Experimental biology.

- Possess a foreign language diploma or certificate equivalent to Level 3 or higher according to the 6-level Foreign Language Proficiency Framework for Vietnam, issued by an institution recognized by the Ministry of Education and Training, or hold an equivalent certificate that remains valid as of the application date.

Candidates must have a university degree in a relevant field:

No	Master's program field of study	Relevant undergraduate degree field of study	Notes
1	Experimental biology	- Biology - Biology Education - Biology Education - Agricultural Engineering - Agricultural Engineering Education - Agronomy - Agriculture - Biotechnology - Biological Engineering - Applied Biology - Biomedical Sciences	

- University graduates in Relevant Fields Requiring Supplementary Knowledge: Graduates from relevant fields may be required to complete supplementary coursework. The list of

fields requiring supplementary knowledge and the corresponding courses to be undertaken will be specified by the program in accordance with current academic regulations:

No	Master's program field of study	Field requiring additional knowledge	Additional courses/modules	Notes
1	Experimental biology	- Crop Science - Animal Husbandry - Agricultural Extension - Soil Science - Plant Protection - Vegetable, Fruit and Landscape Technology - Forestry - Silviculture - Aquaculture - Fisheries Science - Aquatic Animal Pathology - Fisheries Exploitation - Veterinary Medicine - Biomedical Engineering - Natural Science Education - Food Technology - Post-Harvest Technology *Other fields will be considered on a case-by-case basis.*	- Genetics - Animal and Aquaculture - Physiology Plant Physiology - Animal Breeding and Propagation - Plant Breeding and Propagation - Livestock and Poultry Farming - Aquaculture - Animal Nutrition and Feed - Basic Veterinary Medicine - Plant Protection - Plant Diseases	Depending on the specific case, the Faculty will propose the number of supplementary knowledge courses to be selected.

5. ELIGIBLE APPLICANTS/CANDIDATES

Pursuant to the Regulations on Admission and Training for Master's Programs of Quy Nhon University issued under Decision No. 2705/QĐ-ĐHQN dated October 21, 2021; Decision No. 926/QĐ-ĐHQN dated April 25, 2022 amending and supplementing Article 5 of the aforementioned Regulations; and Decision No. 59/QĐ-ĐHQN dated January 9, 2023 on the addition of foreign language certificates to Appendix 1 of the Regulations on Admission and Training for Master's Programs (issued under Decision No. 2705/QĐ-ĐHQN).

6. PROGRAM DURATION AND TOTAL CREDITS

6.1. Program Duration: 02 years

6.2. Total credits: *60* credits ((including **6 internship credits** and **9 graduation project** credits))

Program structure	Credits
General Knowledge	**3**
Fundamental knowledge/ Specialized knowledge	**48**
Required courses	32

Elective courses	16
Master's Project	**9**
Total	**60**

7. TRAINING METHOD, GRADUATION REQUIREMENTS

7.1. Training Method:

Training under the credit system complies with the current regulations of the Ministry of Education and Training and Quy Nhon University.

7.2. Graduation Requirements:

According to the current regulations of the Ministry of Education and Training and Quy Nhon University:

a) Have completed all modules of the training program and successfully defended the master's thesis.

b) Meet the foreign language proficiency requirements of the program prior to the graduation consideration date, as evidenced by one of the following: a foreign language diploma or certificate equivalent to Level 4 under the 6-level Foreign Language Proficiency Framework for Vietnam, as specified in the Appendix to the Regulations on Admission and Training for Master's Programs of Quy Nhon University; other equivalent certificates recognized and published by the Ministry of Education and Training; a university degree or higher in a foreign language; or a university degree or higher in another field where the program is delivered entirely in a foreign language.

c) Have fulfilled all obligations prescribed by Quy Nhon University; are not subject to criminal prosecution; and are not currently under disciplinary action or academic suspension.

8. LEARNING ASSESSMENT

8.1. Grading Scale

Use a 10-point scale for all forms of assessment in the course.

8.2. Format, evaluation criteria, and scoring system.

- Theoretical courses

No	Format	Evaluation criteria	Choose one of the two weighting groups	
1	**Progress Asessment**	*Attendance:* Level of full and active participation in class sessions. *Homework:* Degree of accuracy, appropriateness, and completeness of assigned work. *In-class assignments:* Degree of accuracy, appropriateness, and completeness. *Presentations:* Level of preparation; quality and depth of content knowledge; ability to	40%	50%

		communicate effectively, defend viewpoints, and engage in discussion. *Discussions and group activities:* Level of preparation; depth of knowledge; effectiveness of communication; and ability to express and articulate personal viewpoints. *Practical work:* Level of preparation; degree of fulfillment of practical requirements; and demonstration of creativity.		
2	**Final Exam**	*Written test:* Assessment based on the official answer key and grading criteria. *Presentation:* Level of preparation; depth and accuracy of knowledge; effectiveness of communication; and ability to engage in discussion. *Oral examination:* Accuracy of responses; depth of knowledge; communication skills; and ability to articulate and defend personal viewpoints. *Practical work:* Level of preparation; degree of fulfillment of practical requirements; and demonstration of creativity. *Essay:* Compliance with the required format and quality of content as specified by the instructor.	60%	50%

- Practical course (if any)

Students must attend all practical sessions. The average score of all practical sessions in the semester, rounded to one decimal place, is the grade for the practical course.

- Internship/Practical course

No	Format	Evaluation criteria	Weight
1	**Progress Asessment**	- Level of participation: Degree of full and active engagement in internship activities at the host institution. - Attitude and professionalism: Degree of enthusiasm, responsibility, and seriousness demonstrated during the internship. - Understanding of internship tasks: Level of comprehension and mastery of the assigned internship tasks and related professional issues.	50%
2	**Final**	The format and content of the written report	50%

	Exam	and/or presentation.	

- Graduation Project:

This project will be implemented in accordance with the Regulations on Admission and Training for Master's Degrees of Quy Nhon University. Specific criteria are detailed in M4 of the course.

8.3. Assessment Methods

The assessment methods employed in the Master's program in Natural Sciences are categorized into two main types: formative (progress-based) assessment and summative assessment. These methods are specifically defined in the program description.

9. PROGRAM CONTENT

No	Course Code		Course Name	Semester	Amount of knowledge				Prerequisite Course Code	Managing Faculty	Note
	Lettre	Number			Number of credits	Theory	Practise	Experimental/ Pratical/ Tests			
I. General Knowledge					**3**						
1	THTN	501	Philosophys	1	3	40	0	10		Political theory, law, and state administration	
II. Fundamental knowledge/ Specialized knowledge					**48**						
II.1. Required courses					**32**						
2	SHTN	028	Genetic engineering and applications	1	2	22	8	0		Natural sciences	
3	SHTN	002	Molecular cell biology	1	2	26	0	8		Natural sciences	
4	SHTN	003	Immunology and Application	1	2	25	0	10		Natural sciences	
5	SHTN	029	Developing learners' competencies in teaching biology in high school	1	2	25	0	10		Natural sciences	
6	SHTN	030	Microbiological technology and Applications	2	3	30	0	30	SHTN002	Natural sciences	
7	SHTN	031	Experimental Biochemistry	2	3	30	0	30	SHTN003	Natural sciences	
8	SHTN	032	Research Methods in Experimental Biology	2	3	29	0	32		Natural sciences	

No	Course Code		Course Name	Semester	Amount of knowledge				Prerequisite Course Code	Managing Faculty	Note
	Lettre	Number			Number of credits	Theory	Practise	Experimental/ Pratical/ Tests			
9	SHTN	009	Biological Control	2	3	30	0	30	SHTN001 SHTN002 SHTN003	Natural sciences	
10	SHTN	033	Crop molecular biology and applications	3	3	22	4	38	SHTN001	Natural sciences	
11	SHTN	011	Animal nutrition and food safety	3	3	30	15	0	SHTN006	Natural sciences	
12	SHTN	007	Internship of Experimental Biology 1	3	3	0	0	90	SHTN005 SHTN006 SHTN009	Natural sciences	
13	SHTN	012	Internship of Experimental Biology 2	3	3	0	0	90	SHTN005 SHTN006 SHTN008	Natural sciences	
II.2. Elective courses (16/26 credits)					**16**						
14	SHTN	034	Agroecology and environment	1	2	28	0	4		Natural sciences	
15	SHTN	014	Aquatic organisms	1	2	30	0	0		Natural sciences	
16	SHTN	015	Growth, development in plants and applications	1	2	27	0	6		Natural sciences	
17	SHTN	016	Population genetics and quantitative genetics	1	2	25	0	10		Natural sciences	
18	SHTN	017	Enzyme and application	1	2	25	0	10		Natural sciences	
19	SHTN	018	Medical insects	2	2	27	0	6	SHTN008	Natural sciences	
20	SHTN	035	Preservation technology for agricultural products	2	2	25	0	10	SHTN006 SHTN015	Natural sciences	
21	SHTN	020	Molecular Biology in Medicine	2	2	25	0	10	SHTN001 SHTN002	Natural sciences	
22	SHTN	021	Tolerant physiology in plant	2	2	27	0	6	SHTN001 SHTN002 SHTN015	Natural sciences	
23	SHTN	022	Stem cell and applications	2	2	25	0	10	SHTN001 SHTN002	Natural sciences	

No	Course Code		Course Name	Semester	Amount of knowledge				Prerequisite Course Code	Managing Faculty	Note
	Lettre	Number			Number of credits	Theory	Practise	Experimental/ Pratical/ Tests			
24	SHTN	024	Protein and tolerance in plants	3	2	25	0	10	SHTN001 SHTN002 SHTN015	Natural sciences	
25	SHTN	025	Assisted Reproductive Techniques in animals	3	2	25	0	10	SHTN001 SHTN002	Natural sciences	
26	SHTN	036	Developing biology school curriculum	3	2	25	0	10	SHTN004	Natural sciences	
III.	**Graduation project**				**9**						
27	SHTN	037	Master's Project	4	9			270	SHTN001 SHTN002 SHTN007 SHTN010 SHTN011 SHTN012	Natural sciences	
Total					**60**						

Table of the relationship matrix between modules and learning outcomes

No	Course Name	PLOs							
		1	2	3	4	5	6	7	8
1	Philosophys	M	M			M	M		
2	Genetic engineering and applications	M	M	H		H	H	H	
3	Molecular cell biology		M	M		H	M	H	H
4	Immunology and Application		H	H			M	M	H
5	Developing learners' competencies in teaching biology in high school	M	H			M	M	H	H
6	Microbiological technology and Applications		M	M		H	H	H	H
7	Experimental Biochemistry		M	H		H	M		M
8	Research Methods in Experimental Biology	M	M	M	M		H	M	M
9	Biological Control	M	H		M		M	H	M
10	Crop molecular biology and applications		M	M			H	M	M
11	Animal nutrition and food safety	M	H	M			H	M	
12	Internship of Experimental Biology 1		M	M	M	H	H	H	H
13	Internship of Experimental Biology 2		M	M	M	H	M	H	H

No	Course Name	PLOs							
		1	2	3	4	5	6	7	8
14	Agroecology and environment	M	H			M	M	M	M
15	Aquatic organisms	M	M	H			H	M	
16	Growth, development in plants and applications		M	H			M	H	M
17	Population genetics and quantitative genetics		H			H	M	H	
18	Enzyme and application		M	H		M	M		H
19	Medical insects		H	M	M			H	
20	Preservation technology for agricultural products		M	H			H	M	M
21	Molecular Biology in Medicine		M	H		M	H		M
22	Tolerant physiology in plant		M	M		H	H		H
23	Stem cell and applications		M	M			H	M	H
24	Protein and tolerance in plants		M	H		M	M		H
25	Assisted Reproductive Techniques in animals		H	M		H	H		M
26	Developing biology school curriculum		M			M	M	H	H
27	Master's Project	M	H	H	M	M	H	H	H

10. TRAINING PLAN

No	Course code	Course name	Number of credits	Tentative teaching plan *(Semester)*				Expected instructors	Managing Faculty
				1	2	3	4		
I. **General Knowledge**									
1	THTN501	Philosophys	3	3				Political theory, law, and state administration	Political theory, law, and state administration
II. **Fundamental knowledge/ Specialized knowledge**									
II.1. Required courses			**32**						
2	SHTN028	Genetic engineering and	2	2				Assoc. Prof. Dr. Nguyen Thi Mong Diep Dr. Nguyen Thanh Liem	Natural sciences

No	Course code	Course name	Number of credits	Tentative teaching plan *(Semester)*				Expected instructors	Managing Faculty
				1	2	3	4		
		applications							
3	SHTN002	Molecular cell biology	2	2				Dr. Tran Thanh Son Dr. Nguyen Thanh Liem	Natural sciences
4	SHTN003	Immunology and Application	2	2				Dr. Ngo Kim Khue Assoc. Prof. Dr. Nguyen Thi Mong Diep	Natural sciences
5	SHTN029	Developing learners' competencies in teaching biology in high school	2	2				Dr. Khuu Thuan Vu Dr. Tran Thanh Son	Natural sciences
6	SHTN030	Microbiological technology and Applications	3		3			Assoc. Prof. Dr. Nguyen Thi Mong Diep Dr. Ngo Kim Khue	Natural sciences
7	SHTN031	Experimental Biochemistry	3		3			Dr. Truong Thi Hue Dr. Nguyen Thanh Liem	Natural sciences
8	SHTN032	Research Methods in Experimental Biology	3		3			Dr. Bui Hong Hai Dr. Nguyen Thanh Liem	Natural sciences
9	SHTN009	Biological Control	3		3			Dr. Huynh Thi Thanh Tra Dr. Nguyen Thanh Liem	Natural sciences
10	SHTN033	Crop molecular biology and applications	3			3		Dr. Nguyen Thanh Liem Dr. Truong Thi Hue	Natural sciences
11	SHTN011	Animal nutrition and food safety	3			3		Dr. Vo Van Chi Dr. Ngo Kim Khue	Natural sciences
12	SHTN007	Internship of Experimental Biology 1	3			3		Dr. Bui Hong Hai Dr. Nguyen Thanh Liem	Natural sciences
13	SHTN012	Internship of Experimental Biology 2	3			3		Dr. Vo Van Chi Dr. Tran Thanh Son	Natural sciences
II.2. Elective courses (16/26 credits)			**16**						
14	SHTN034	Agroecology and environment	2	2				Dr. Bui Hong Hai Dr. Vo Van Chi	Natural sciences
15	SHTN014	Aquatic organisms	2	2				Dr. Vo Van Chi Dr. Bui Hong Hai	Natural sciences

No	Course code	Course name	Number of credits	Tentative teaching plan *(Semester)*				Expected instructors	Managing Faculty
				1	2	3	4		
16	SHTN015	Growth, development in plants and applications	2	2				Dr. Huynh Thi Thanh Tra Dr. Nguyen Thanh Liem	Natural sciences
17	SHTN016	Population genetics and quantitative genetics	2	2				Dr. Tran Thanh Son Dr. Nguyen Thanh Liem	Natural sciences
18	SHTN017	Enzyme and application	2	2				Dr. Truong Thi Hue Dr. Nguyen Thanh Liem	Natural sciences
19	SHTN018	Medical insects	2		2			Dr. Ngo Kim Khue Dr. Tran Thanh Son	Natural sciences
20	SHTN035	Preservation technology for agricultural products	2		2			Dr. Bui Hong Hai Dr. Truong Thi Hue	Natural sciences
21	SHTN020	Molecular Biology in Medicine	2		2			Dr. Truong Thi Hue Assoc. Prof. Dr. Nguyen Thi Mong Diep	Natural sciences
22	SHTN021	Tolerant physiology in plant	2		2			Dr. Nguyen Thanh Liem Dr. Huynh Thi Thanh Tra	Natural sciences
23	SHTN022	Stem cell and applications	2		2			Dr. Tran Thanh Son Assoc. Prof. Dr. Nguyen Thi Mong Diep	Natural sciences
24	SHTN024	Protein and tolerance in plants	2			2		Dr. Truong Thi Hue Dr. Nguyen Thanh Liem	Natural sciences
25	SHTN025	Assisted Reproductive Techniques in animals	2			2		Assoc. Prof. Dr. Nguyen Thi Mong Diep Dr. Vo Van Chi	Natural sciences
26	SHTN036	Developing biology school curriculum	2			2		Dr. Khuu Thuan Vu Dr. Tran Thanh Son	Natural sciences
III. Graduation project			**9**						
27	SHTN037	Master's Project	9				9		Natural sciences
Total			**60**	**17**	**18**	**16**	**9**		

11. GUIDELINES FOR PROGRAM IMPLEMENTATION

- This training program shall be implemented from the 28th cohort (2025 intake) for students majoring in Natural Sciences.

- The training process is conducted in accordance with the approved curriculum, training objectives, target learners, human resource demands, and specific program requirements. For elective courses, based on development trends and societal needs, the Faculty of Professional Management shall advise students in selecting appropriate courses.

- The Head of the Faculty of Professional Management is responsible for organizing and providing guidance on the development of detailed course syllabi to ensure that program objectives, content, and requirements are fulfilled, while also meeting the needs of learners and society.

- The training program shall be reviewed and updated at least once every two years to ensure alignment with developments in the Natural Sciences field and socio-economic demands.

Binh Dinh, February 14, 2025

RECTOR

Assoc. Prof. Dr. Doan Duc Tung