



NONG LAM UNIVERSITY – HO CHI MINH CITY
FACULTY OF FISHERIES
DEPARTMENT OF AQUACULTURE TECHNOLOGY



PROGRAMME SPECIFICATION

BACHELOR OF AQUACULTURE

PROGRAMME CODE: 7620301



APRIL, 2022

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PART I. GENERAL INFORMATION OF THE PROGRAMME

1.1 Programme title: Aquaculture

1.2 Awarding and teaching institution: Nong Lam University - Ho Chi Minh City

1.3 Degree: Engineer of Aquaculture

1.4 Study mode: Full-time, on campus

1.5 Training time: 4 years

1.6 Admission criteria

High school graduate candidates must pass the annual National High School Graduation Examination which be held in July by MOET or examine their GPA at high school or pass the HCMC National University's competency assessment examination. They must have total score of Mathematics, Physics and Chemistry (Block 1); or Mathematics, Chemistry and Biology (Block 2); or Mathematics, Chemistry and English (Block 3); or Mathematics, Biology and English (Block 4) higher than the admission score set by the NLU based on the student admission quota from MOET. The admission score will be published in August every year.

PART II. PROGRAMME OBJECTIVES AND EXPECTED LEARNING OUTCOMES

2.1 Programme objectives (POs)

The Bachelor of Aquaculture (AQUA) programme provides students with:

- PO 1: Form a solid foundation of general education, fundamental and specialized knowledge in aquaculture.
- PO 2: Master skills of self-study, research, problem solving and creative thinking in aquaculture.
- PO 3: Effectively communicate, independently work or on a team, and be well adapted in a multicultural environment.
- PO 4: Apply advanced knowledge in field production, research and improve aquaculture technology towards environmental friendliness and sustainability.
- PO 5: Have social responsibility, professional ethics, dedication and lifelong learning awareness and conserve human health and habitats.

2.2 Expected learning outcomes (PLOs)

After successful completion of the AQUA programme, graduates will be able to:



A. KNOWLEDGES

General knowledges

- PLO 1: Form a solid foundation of basic knowledges of natural and social sciences.
- PLO 2: Masterly apply fundamental and specialized knowledges in the aquaculture industry.

Professional knowledges

- PLO 3: Apply aquaculture technology into practices.
- PLO 4: Comply with national and international laws and regulations in fisheries sector.

B. SKILLS

Generic skills

- PLO 5: Analyze and solve problems in the aquaculture industry
- PLO 6: Conduct scientific research in the field of aquaculture
- PLO 7: Use English effectively in communication and aquaculture practices
- PLO 8: Work independently or in a team, and efficiently lead a team.
- PLO 9: Communicate effectively by soft skills.

Professional skills

- PLO 10: Apply masterly aquaculture technology.
- PLO 11: Manage in responsible aquaculture practices.
- PLO 12: Develop techniques and provide viable solutions in aquaculture industry.

C. ATTITUDES

Awareness

- PLO 13: Possess willingness to learn and update scientific and technical information in aquaculture

Attitudes

- PLO 14: Respect professional ethics, offer fair judgements and objective solutions.
- PLO 15: Be well-adapted to the work environment in aquaculture.

2.3 The alignment between POs and PLOs of the AQUA programme

POs	PLOs														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	1													
2			4	4											
3					2	2	2	2	2						
4										5	5	5			
5													3	6	6

1
2
3

General knowledges

General skills

Awareness

4
5
6

Professional knowledges

Professional skills

Attitudes

PART III. PROGRAMME STRUCTURE AND CURRICULUM

3.1 Programme structure

Group	Credits		
	Compulsory	Elective	Total
General knowledge	45	4	49
Fundamental knowledge	43	5	48
Specialized knowledge	40	21	61
Total	128	30	158

3.2 Curriculum

The curriculum of **AQUA** programme was issued under the Decision 3434/QĐ-DHNL-DT, dated 11th November 2020 by NLU's President.

Degree: Engineer of Aquaculture

Faculty: Faculty of Fisheries

The minimum number of credits accumulated: 158

Minimum GPA: 2.0

Programme code: 7620301

Major: Aquaculture

Programme: Aquaculture



No.	Course code	Course name	Credits	Total period	Theory	Practice	Field Practice	Minor Thesis	Thesis	Year	Semester	Prior course	Prerequisite course	Concurrent course
1. Fundamental knowledge														
Required courses														
1	200101	Philosophy of Marxism and Leninism	3	45	45	0	0	0	0	1	1			
2	200102	Political Economy of Marxism and Leninism	2	30	30	0	0	0	0	1	1			
3	202112	Advanced Mathematics Level B1	2	30	30	0	0	0	0	1	1			
4	202301	General Chemistry	3	45	45	0	0	0	0	1	1			
5	202304	General Chemistry Practice	1	30	0	30	0	0	0	1	1			
6	202401	General Biology	2	30	30	0	0	0	0	1	1			
7	202402	General Biology Practice	1	30	0	30	0	0	0	1	1			





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8	213603	Academic English 1*	4	60	60	0	0	0	0	1	1			
9	200103	Scientific Socialism	2	30	30	0	0	0	0	1	2	200102		
10	200201	National Defence Education 1 (theory)*	3	45	45	0	0	0	0	1	2			
11	200202	National Defence Education 2 (practice)*	3	90	0	90	0	0	0	1	2			
12	202113	Advanced Mathematics Level B2	2	30	30	0	0	0	0	1	2			
13	202501	Physical Education 1*	1	45	0	0	45	0	0	1	2			
14	213604	Academic English 2*	3	45	45	0	0	0	0	1	2	213603		
15	214103	Introduction to Informatics*	3	60	30	30	0	0	0	1	2			
16	200107	Ho Chi Minh Ideologies	2	30	30	0	0	0	0	2	1	200103		
17	202121	Mathematic Probability and Statistics	3	45	45	0	0	0	0	2	1	202113		
18	200105	History of Vietnam	2	30	30	0	0	0	0	2	2	200107		

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		Communist Party													
19	202503	Swimming*	1	45	0	0	45	0	0	2	2				
20	202622	Introduction to Vietnamese Law System	2	30	30	0	0	0	0	2	2				
Total			45	825	555	180	90	0	0						
Elective courses - accumulated at least 4 credits															
1	202302	Analytical Chemistry	2	30	30	0	0	0	0	1	2	202301			
2	202305	Analytical Chemistry Practice	1	30	0	30	0	0	0	1	2				
3	202403	Biodiversity	2	30	30	0	0	0	0	2	1				
4	202621	Introduction to Sociology	2	30	30	0	0	0	0	2	1				
5	202620	Communication Skills	2	30	30	0	0	0	0	2	2				
6	208416	Introduction to Management	2	30	30	0	0	0	0	2	2				
Total			11	180	150	30	0	0	0						
2. Fundamental specialized knowledge															
Required courses															
1	203104	General Biochemistry	3	60	30	30	0	0	0	1	2	202301			
2	203203	General Genetics	3	60	30	30	0	0	0	1	2				
3	206109	Introduction to Fisheries Science	2	30	30	0	0	0	0	1	2				
4	206114	Aquatic Botany	3	60	30	30	0	0	0	1	2	202401			
5	206103	Water Quality Management in Aquaculture	3	60	30	30	0	0	0	2	1	202301			
6	206105	Zooplankton and Benthos	3	60	30	30	0	0	0	2	1	202401			
7	206106	Ichthyology	3	60	30	30	0	0	0	2	1	202401			





8	206316	Specialised Biochemistry for Fisheries	2	30	30	0	0	0	0	2	1	203104		
9	203516	General Microbiology	3	60	30	30	0	0	0	2	2	202401 203104		
10	206115	Physiology of Aquatic Animals	4	75	45	30	0	0	0	2	2	206316		
11	206116	Statistics and Experimental Design	3	60	30	30	0	0	0	2	2	202121		
12	206215	Nutrition and Feed Technology in Aquaculture	4	75	45	30	0	0	0	3	1	206316		
13	206301	Introduction to Aquatic Animal Pathology	2	30	30	0	0	0	0	3	1			
14	206420	Introduction to Fisheries Law	2	30	30	0	0	0	0	4	1	202622		
15	206520	Introduction to Aquatic Products Preservation and Processing	3	60	30	30	0	0	0	4	1			
<i>Total</i>			<i>43</i>	<i>810</i>	<i>480</i>	<i>330</i>	<i>0</i>	<i>0</i>	<i>0</i>					
Elective courses - accumulated at least 5 credits														
1	206424	Entrepreneurship	2	30	30	0	0	0	0	2	1	206109		
2	206113	Aquatic Ecology	3	45	45	0	0	0	0	2	2	202401		
3	206117	Research Methods for Fish Biology	2	40	20	20	0	0	0	3	1			
4	206402	Introduction to Fishing Technology	2	30	30	0	0	0	0	3	2			
<i>Total</i>			<i>9</i>	<i>145</i>	<i>125</i>	<i>20</i>	<i>0</i>	<i>0</i>	<i>0</i>					
3. Specialized knowledge														
Required courses														





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1	206214	English for Aquaculture	2	30	30	0	0	0	0	2	1			
2	206205	Marine Fish Culture Techniques	2	30	30	0	0	0	0	3	1	206103 206115		
3	206216	Freshwater Fish Culture Techniques	3	60	30	30	0	0	0	3	1	206103 206115		
4	206405	Fisheries Economics	2	30	30	0	0	0	0	3	1	206109		
5	206217	Fish Seed Production Techniques	4	75	45	30	0	0	0	3	2	206103 206115		
6	206218	Crustacean Seed Production and Culture Techniques	4	75	45	30	0	0	0	3	2	206103 206115		
7	206219	Molluscan Seed Production and Culture Techniques	3	50	40	10	0	0	0	3	2	206103		
8	206221	Aquaculture Engineering	3	60	30	30	0	0	0	3	2			
9	206814	Field Practice for Freshwater Aquaculture	4	120	0	0	120	0	0	3	2	206216 206217 206221		
10	206307	Shrimp Diseases	3	60	30	30	0	0	0	4	1	206301		
11	206315	English for Aquatic Animal Pathology	2	30	30	0	0	0	0	4	1			
12	206319	Fish Diseases	4	75	45	30	0	0	0	4	1	206216 206205		
13	206815	Field Practice for Brackishwater and Marine Aquaculture	4	120	0	0	120	0	0	4	2	206218; 206219 206205; 206221		
Total			40	815	385	190	240	0	0					





Elective courses - accumulated at least 9 credits														
1	206406	Fisheries Extension	2	30	30	0	0	0	0	3	1	206109		
2	206312	Health Management of Aquatic Animals	2	30	30	0	0	0	0	3	2	206301		
3	206421	Fisheries Production Management	2	30	30	0	0	0	0	3	2	206109		
4	206426	Aquatic Resources Management	2	30	30	0	0	0	0	3	2	206109		
5	206313	Ornamental Fish Diseases	2	45	15	30	0	0	0	4	1	206301		
6	206404	Planning and Management of Fisheries Development	2	30	30	0	0	0	0	4	1	206109		
7	206427	Aqua-business Management	3	45	45	0	0	0	0	4	1	206109		
8	206429	Environmental Impact Assessment in Fisheries	3	60	30	30	0	0	0	4	1	206109		
9	206210	Applied Genetics in Aquaculture**	2	30	30	0	0	0	0	4	2	203203		
10	206220	Ornamental Fish Culture Techniques**	2	40	20	20	0	0	0	4	2	206103		
11	206303	Applied Microbiology in Aquaculture**	2	30	30	0	0	0	0	4	2	203516		
12	206310	Drugs and Chemicals in Aquaculture**	2	30	30	0	0	0	0	4	2	203516		
13	206409	Fisheries Marketing**	2	30	30	0	0	0	0	4	2	206109		
14	206513	Quality Assessment for Aquatic Products**	2	30	30	0	0	0	0	4	2			
Total			30	490	410	80	0	0	0					

Elective courses - accumulated at least 12 credits

1	206904	Minor Thesis	6	90	0	0	0	90		4	2			
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2	206905	Thesis	12	180	0	0	0	0	180	4	2			
3	206910	Special Study on Aquatic Resources Management	2	30	0	0	0	30	0	4	2			
4	206911	Special Study on Diseases of Aquatic Organisms	2	30	0	0	0	30	0	4	2			
5	206912	Special Study on Aquatic Animal Health Management	2	30	0	0	0	30	0	4	2			
6	206913	Special Study on Fisheries Trading	2	30	0	0	0	30	0	4	2			
7	206914	Special Study on Aquatic Products Research and Development	2	30	0	0	0	30	0	4	2			
8	206915	Special Study on Aquatic Products Hygiene and Safety Assurance	2	30	0	0	0	30	0	4	2			
9	206916	Special Study on Aquatic Products Quality Assurance	2	30	0	0	0	30	0	4	2			
10	206917	Special Study on Aquaculture Techniques	2	30	0	0	0	30	0	4	2			
11	206918	Special Study on Aquatic Seed Production Techniques	2	30	0	0	0	30	0	4	2			
<i>Total</i>			<i>36</i>	<i>540</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>360</i>	<i>180</i>					

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Total of compulsory credits 128

Total of elective credits 30

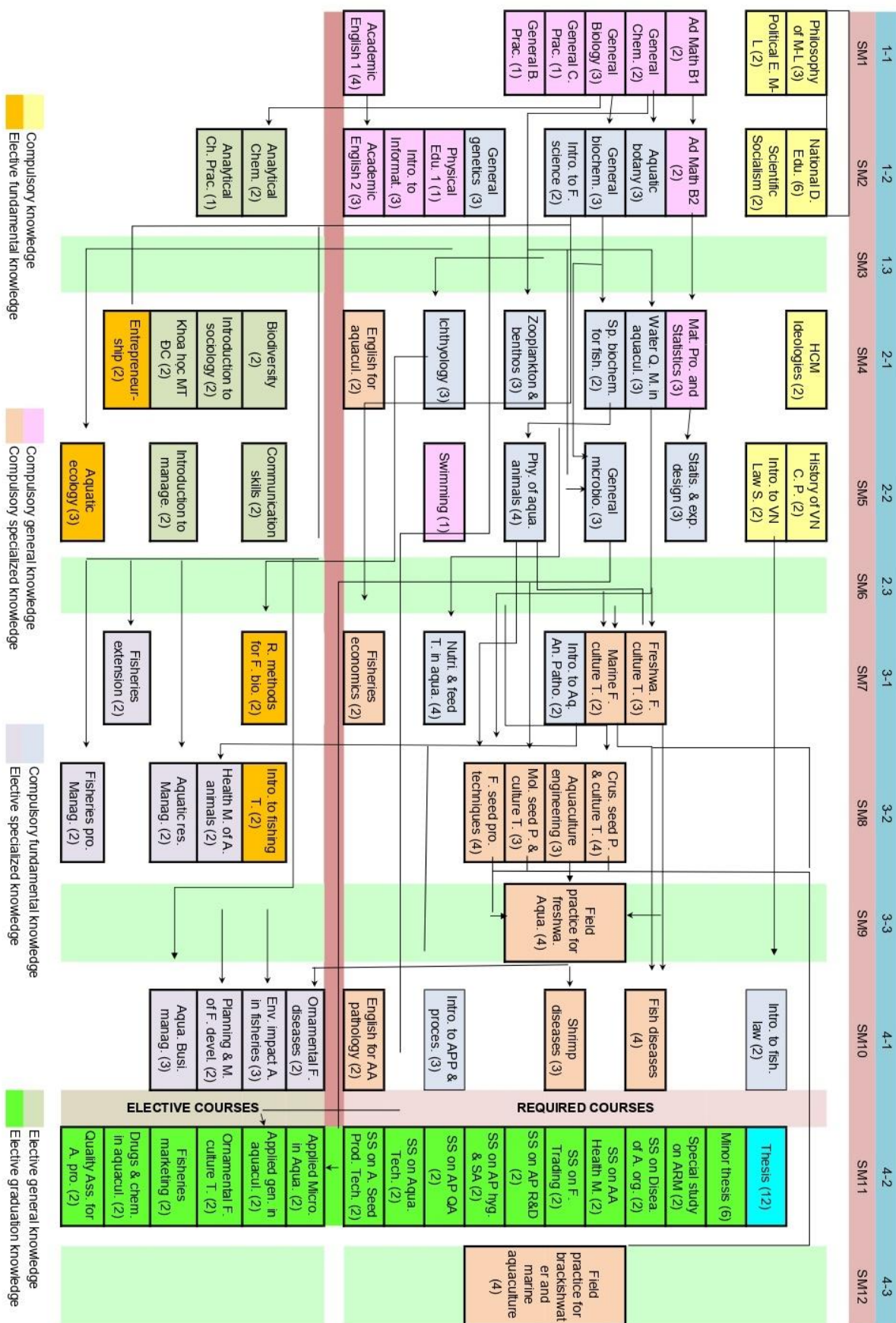
12 credits of graduation (III.3) are structured into three options:

- (1) Thesis (12 credits)
 - (2) Minor thesis (6 credits) + completion of 2 credits of Special study +
completion of 4 credits of elective courses (**)
 - (3) The courses can replace thesis: Completion of 6 credits of Special study +
completion of 6 credits of elective courses (**)
- (*) conditional courses, pass required but not included in GPA

Students must obtain the college exit outcomes for English and Informatics as specified by NLU



CURRICULUM MAP OF BACHELOR AQUACULTURE PROGRAMME





3.3 CLOs and PLOs matrix

No.	Course code	Course name	Credits	PLOs														
				Knowledge				Skills								Attitude		
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. Fundamental knowledge																		
I. 1 Required courses																		
1	200101	Philosophy of Marxism and Leninism	3	H	N	N	N	N	N	N	N	N	N	N	N	N	S	N
2	200102	Political Economy of Marxism and Leninism	2	H	N	N	N	N	N	N	N	N	N	N	N	N	S	S
3	202112	Advanced Mathematics Level B1	2	H	S	N	N	N	N	N	N	N	N	N	N	N	N	N
4	202301	General Chemistry	3	H	S	N	N	S	S	N	S	N	N	N	N	N	N	N
5	202304	General Chemistry Practice	1	H	S	N	N	S	S	N	S	N	N	N	N	N	N	N
6	202401	General Biology	2	H	N	N	N	S	S	N	S	N	N	N	N	S	S	S
7	202402	General Biology Practice	1	H	N	N	N	S	S	N	S	N	N	N	N	S	S	S
8	213603	Academic English 1*	4	N	N	N	N	N	N	H	N	N	N	N	N	S	N	S
9	200103	Scientific Socialism	2	H	N	N	N	N	N	N	N	N	N	N	N	N	S	N
10	200201	National Defence Education 1 (theory)*	3	N	N	N	N	N	N	N	S	S	N	N	N	N	N	N





11	200202	National Defence Education 2 (practice)*	3	N	N	N	N	N	N	N	S	S	N	N	N	N	N	N
12	202113	Advanced Mathematics Level B2	2	H	S	N	N	N	N	N	N	N	N	N	N	N	N	N
13	202501	Physical Education 1*	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	S
14	213604	Academic English 2*	3	N	N	N	N	N	N	H	N	N	N	N	N	S	N	S
15	214103	Introduction to Informatics*	3	N	N	N	N	N	N	N	N	S	N	N	N	S	N	S
16	200107	Ho Chi Minh Ideologies	2	H	N	N	N	N	N	N	N	N	N	N	N	S	S	N
17	202121	Mathematic Probability and Statistics	3	H	S	N	N	N	S	N	N	N	N	N	N	N	N	N
18	200105	History of Vietnam Communist Party	2	H	N	N	N	N	N	N	N	N	N	N	N	S	S	N
19	202503	Swimming*	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	S
20	202622	Introduction to Vietnamese Law System	2	H	N	N	H	N	N	N	N	N	N	N	N	S	S	S
I.2 Elective courses - accumulated at least 4 credits																		
1	202302	Analytical Chemistry	2	H	S	N	N	S	S	N	S	N	N	N	N	N	N	N
2	202305	Analytical Chemistry Practice	1	H	S	N	N	S	S	N	S	N	N	N	N	N	N	N





3	202403	Biodiversity	2	H	N	N	N	S	S	N	S	N	N	N	N	S	S	S
4	202621	Introduction to Sociology	2	H	N	N	N	N	N	N	N	N	N	N	N	N	S	N
5	202620	Communication Skills	2	N	N	N	N	N	N	N	S	H	N	N	N	S	N	S
6	208416	Introduction to Management	2	S	N	N	N	S	N	N	S	S	N	N	N	N	S	S
II. Fundamental specialized knowledge																		
II.1 Required courses																		
1	203104	General Biochemistry	3	H	S	N	N	S	S	N	S	S	S	S	N	S	S	S
2	203203	General Genetics	3	H	S	S	N	S	S	N	S	S	S	N	S	S	S	S
3	206109	Introduction to Fisheries Science	2	H	H	S	S	S	S	S	S	S	S	S	S	H	S	S
4	206114	Aquatic Botany	3	S	S	H	N	S	H	S	N	N	S	S	S	S	S	S
5	206103	Water Quality Management in Aquaculture	3	S	H	S	S	H	S	S	S	S	S	S	S	S	S	S
6	206105	Zooplankton and Benthos	3	S	S	S	N	S	H	S	S	S	S	S	S	S	S	S
7	206106	Ichthyology	3	S	S	S	S	S	H	S	S	S	N	N	S	S	S	S
8	206316	Specialised Biochemistry for Fisheries	2	H	H	S	N	S	S	S	S	S	N	S	S	S	S	S
9	203516	General Microbiology	3	S	S	S	S	S	H	S	S	S	S	S	S	H	S	N
10	206115	Physiology of Aquatic Animals	4	S	H	S	S	S	H	S	S	S	S	S	S	S	S	S





11	206116	Statistics and Experimental Design	3	N	H	H	N	N	H	S	S	N	N	N	S	S	S	N
12	206215	Fish Nutrition and Feeding for Aquaculture	4	S	H	H	S	H	S	S	S	S	S	H	H	S	S	H
13	206301	Introduction to Aquatic Animal Pathology	2	N	H	S	S	H	S	S	S	S	S	H	S	S	S	S
14	206420	Introduction to Fisheries Law	2	S	S	N	H	H	N	S	S	H	N	H	N	S	H	N
15	206520	Introduction to Aquatic Products Preservation and Processing	3	S	S	S	S	N	S	S	S	S	N	S	S	S	S	S
II.2 Elective courses - accumulated at least 5 credits																		
1	206424	Entrepreneurship	2	N	N	N	S	N	N	S	H	H	N	N	S	S	S	S
2	206113	Aquatic Ecology	3	H	S	N	N	N	N	N	H	H	S	N	N	S	S	N
3	206117	Research Methods for Fish Biology	2	S	S	N	N	S	H	N	S	N	S	S	S	S	S	S
4	206402	Introduction to Fishing Technology	2	S	S	S	S	S	S	N	S	S	N	N	S	H	S	S
III. Specialized knowledge																		
III.1 Required courses																		
1	206214	English for Aquaculture	2	N	N	S	N	N	S	H	N	S	N	N	N	S	N	N





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2	206205	Marine Fish Culture Techniques	2	N	H	H	N	S	H	S	S	S	H	H	H	S	S	S
3	206216	Freshwater Fish Culture Techniques	3	N	H	H	N	H	S	N	S	S	H	S	S	S	S	H
4	206405	Fisheries Economics	2	S	H	S	N	H	H	N	H	S	S	S	S	S	S	S
5	206217	Fish Seed Production Techniques	4	S	H	H	S	S	H	N	S	N	H	S	H	S	S	S
6	206218	Crustacean Seed Production and Culture Techniques	4	N	H	H	N	H	S	N	S	N	H	H	H	S	S	S
7	206219	Molluscan Seed Production and Culture Techniques	3	S	H	H	S	H	S	S	S	S	H	H	H	S	S	S
8	206221	Aquaculture Engineering	3	H	H	H	S	H	S	S	S	S	H	H	H	S	S	S
9	206814	Field Practice for Freshwater Aquaculture	4	N	H	H	N	H	N	N	S	S	H	S	S	S	S	H
10	206307	Shrimp Diseases	3	N	H	H	S	H	S	S	H	H	S	S	H	H	S	S
11	206315	English for Aquatic Animal Pathology	2	S	S	H	H	H	S	S	S	S	S	S	S	S	H	N
12	206319	Fish Diseases	4	N	S	S	H	H	S	S	S	S	H	H	H	S	H	S





13	206815	Field Practice for Brackishwater and Marine Aquaculture	4	N	H	H	N	H	N	N	S	S	H	S	S	S	S	H
III.2 Elective courses - accumulated at least 9 credits																		
1	206406	Fisheries Extension	2	S	H	S	N	H	S	N	H	S	S	H	S	S	S	H
2	206312	Health Management of Aquatic Animals	2	S	H	N	S	H	N	N	S	S	S	H	H	N	S	N
3	206421	Fisheries Production Management	2	S	H	S	N	H	H	N	H	S	S	H	S	S	S	H
4	206426	Aquatic Resources Management	2	S	S	S	H	S	S	S	H	H	N	H	S	H	H	S
5	206313	Ornamental Fish Diseases	2	N	S	S	H	H	S	S	S	S	H	H	H	S	S	S
6	206404	Planning and Management of Fisheries Development	2	S	H	S	S	S	N	N	H	H	S	S	H	S	S	N
7	206427	Aqua-business Management	3	N	S	N	S	S	S	N	H	S	N	S	S	S	S	S
8	206429	Environmental Impact Assessment in Fisheries	3	S	S	S	N	H	S	N	H	H	N	S	N	S	S	N
9	206210	Applied Genetics in Aquaculture**	2	S	H	H	N	H	H	S	S	S	H	S	H	S	S	S





10	206220	Ornamental Fish Culture Techniques**	2	N	H	H	N	H	S	N	S	S	H	S	S	S	S	H
11	206303	Applied Microbiology in Aquaculture**	2	N	H	H	N	H	H	S	S	S	S	S	S	H	N	S
12	206310	Drugs and Chemicals in Aquaculture**	2	S	S	H	H	H	S	S	S	S	S	S	S	S	S	S
13	206409	Fisheries Marketing**	2	N	S	N	N	S	S	N	H	H	N	N	S	S	S	S
14	206513	Quality Assessment for Aquatic Products**	2	N	S	N	S	H	S	S	S	S	N	H	N	S	S	S
III.3 Elective courses - accumulated at least 12 credits																		
1	206904	Minor thesis	6	H	H	H	S	H	H	S	H	H	H	S	H	H	S	H
2	206905	Thesis	12	H	H	H	S	H	H	S	H	H	H	S	H	H	S	H
3	206910	Special Study on Aquatic Resources Management	2	S	H	S	H	S	H	S	S	H	S	S	S	H	H	S
4	206911	Special Study on Diseases of Aquatic Organisms	2	S	H	S	S	H	H	S	S	H	S	S	H	H	S	S
5	206912	Special Study on Aquatic Animal Health Management	2	S	H	S	S	H	H	S	S	H	S	S	N	H	S	S





6	206913	Special Study on Fisheries Trading	2	S	S	N	S	H	H	S	S	H	N	S	S	H	H	S
7	206914	Special Study on Aquatic Products Research and Development	2	S	S	S	S	S	S	S	S	H	S	S	S	H	S	S
8	206915	Special Study on Aquatic Products Hygiene and Safety Assurance	2	S	S	S	H	S	S	S	S	H	S	S	S	H	S	S
9	206916	Special Study on Aquatic Products Quality Assurance	2	S	S	S	H	S	S	S	S	H	S	H	S	H	S	S
10	206917	Special Study on Aquaculture Techniques	2	S	H	H	S	H	H	S	S	H	H	H	H	H	S	S
11	206918	Special Study on Aquatic Seed Production Techniques	2	S	H	H	S	H	H	S	S	H	H	H	H	H	S	S

N: Not supported; **S:** Supported; **H:** Highly supported

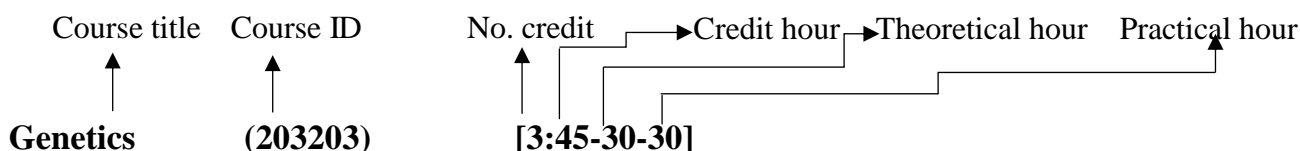


PART IV. BRIEF OUTLINE OF ALL COURSES IN THE PROGRAMME

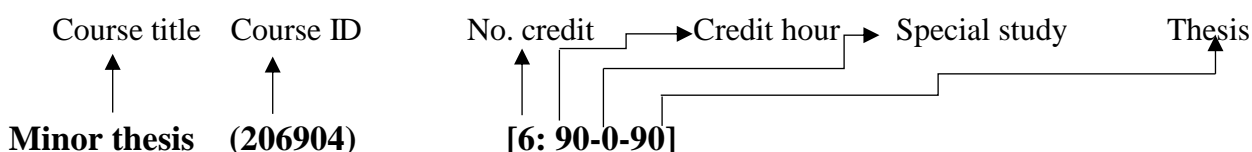
A brief description of each course in curriculum frame are described below. Each course included the title, number of credits, teaching hour, theoretical hour, and practical hour. A brief summary of the course content is also presented.

Example:

The notation of the course **Genetics (203203) [3: 45-30-30]** are explained as below:



The notation of the **Minor thesis/Thesis/Special Study (206904) [6: 90-0-90]** are explained as below:



Credit is used to calculate student workload. One credit is equal to 15 theoretical class hours, 30-45 hours of practice, experiment, or discussion, 45-90 practical hours at the fields, 45-60 hours of preparing/writing term paper, project, and graduation thesis. For theoretical, practical, or experimental modules, in order to obtain 1 credit student must spend at least 30 hours for individual preparation.

Credit hour is quantity which used to measure the workload of student. Credit hour is divided into three types base on teaching and learning activities, quantity of time. This is determined as follows:

Credit hour in class	1 hour in class	2 hours for individual preparation
Credit hour for practice	2 hours for practice	1 hours for individual preparation
Credit hour for individual preparation		3 hours for individual preparation

One class hour in credit system is equal to 50 minutes.

4.1 General Courses

4.1.1 Required courses

Philosophy of Marxism and Leninism (200101) [3: 45-45-0]: The worldview and philosophical methodology of Marxism-Leninism; the economic doctrine of Marxism-Leninism on the method of capitalist production; Marxism-Leninism on the theory of scientific socialism.





Political Economy of Marxism and Leninism (200102) [2: 30-30-0]: Providing the outline of concepts, categories, economic rules, methodology of economic thinking of Marxist-Leninist political economy as well as providing for students with a systematic, selective basic knowledge of the Marxist - Leninist political economy.

Advanced Mathematics level B1 (202112) [2:30-30-0]: The course includes knowledge of mathematical analysis such as single variable differential and integral calculus, infinite series, and the application of mathematical analysis in aquaculture.

General Chemistry (202301) [3:45-45-0]: General chemistry covers the fundamental chemical and physical principles and their applications to the properties and transformations of materials, including the concept of energy and its uses, atomic and molecular structure, periodic classification of the elements, and chemical bonding. The study of reaction rates and equilibrium is introduced, and redox chemistry is continued and furthered to include electrochemistry.

This course is also an intensive, comprehensive introduction to the chemistry of carbon and its importance to biological molecules. Topics include current ideas of bonding and structure, major reaction mechanisms and pathways, a discussion to determine the structure and stereochemistry of organic compounds. Functional groups to be covered include hydrocarbons, alcohols, ethers, aldehydes and ketones, carboxylic acids, carboxylic acid derivatives, amines, and some of the chemistry of amino acids, peptides, carbohydrates, and nucleic acids.

General Chemistry Practice (202304) [1:30-0-30]: Apply the knowledge of concepts from General Chemistry in an actual laboratory situation; design and perform experiments; determine the rate, order, and activation energy of chemical reactions by varying concentrations and/or temperature; measure concentrations, solubility, and how to set up and use an electrolysis cell.

This course also introduces the student to basic techniques and procedures in isolation, purification, and characterization of organic compounds and simple reactions used in the organic chemistry laboratory. The student will also be trained in the proper way to write a scientific laboratory report

General Biology (202401) [2: 30-30-0]: General Biology introduces students to the fundamental knowledge of cells, the structural and functional unit of life. In this course,





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students will study: - The structures of cells, how cells interact with each other and their environment - The biochemical activities of cells to see how DNA, proteins and other biological molecules are involved in biological processes. -Gene expression and their involvement in inheritance and development. At the end of this course, students will be able to describe, distinguish and apply basic concepts of cell biology in everyday life and professional activities.

General Biology Practice (202402) [1:30-0-30]: General Biology Practice is designed to complement topics presented in General Biology. In this course students work to: -Be familiar with and use the light microscope to examine cells, tissues. - Investigate the biochemical components of biological samples. -Investigate the effect of temperature on the rate of enzyme activities; of light intensity on photosynthesis; of oxygen on respiration. - Demonstrate osmosis in cells and tissues. - Investigate cell cycles.

At the end of this course, students will be able to: - Follow instruction, safety regulation, and correct manipulation of apparatus. - Collect data, compare the results, interpret the results and draw reasonable conclusions from the results. - Apply technical skills in agriculture, food safety and food technology. - Recognize the role and responsibility of an engineer and have an industrial work manner.

Academic English 1 (213603) [4: 60-60-0]: Review basic grammar sections. New knowledge of exam questions, exam contents, skills for English test at the basic level.

Science Socialism (200103) [2: 30-30-0]: Basic knowledge of sociology, including the history of sociology formation and development; objects and functions of sociology; sociological concepts and categories; some theoretical views on sociology; sociological research methods. Identify, evaluate and resolve positively and scientifically social issues raised in life; contribute to forming correct and stable political attitude; sense of discipline; sense of responsibility, healthy soul, pure.

National Defense Education 1 (theory) (200201) [3: 45-45-0]: National defense-security education is a part of the national education, a fundamental content in building the all-people national defense and people's security; is the main subject in the educational program of the upper secondary school and the professional intermediate training level, colleges and universities.



National defense and security education contributes to the comprehensive education of students about patriotism, love of socialism, pride and respect for the nation's tradition of fighting against foreign aggression. The Vietnamese people's armed forces; have a sense of vigilance against the plots and tricks of hostile forces; have basic knowledge of the Party's military line and state management of national defense and security; have military skills to participate in the cause of building and consolidating the all-people national defense and people's security, ready to defend the socialist Vietnamese Fatherland.

National Defense Education 2 (practice) (200202) [3: 90-0-90]: Practical skills, techniques, military tactics for the platoon, short-gun using techniques, grenade using techniques and some commonly used weapons of infantry, ready to participate in the strategic task of building and defending the Socialist Republic of Vietnam.

Advanced Mathematics level B2 (202113) [2: 30-30-0]: The first part of the course provides introductory knowledge about linear algebra and some applications of linear algebra in solving the system of equations. The second part equips knowledge about multiple-variable calculus and multivariable differentials. In both sections, we are interested in applications of linear algebra and analysis in real-world situations. This course covers the more advanced aspects of engineering mathematics that are common to all first engineering degrees, and it differs from texts with similar names by the emphasis it places on certain topics, the systematic development of the underlying theory before making applications, and the inclusion of new material.

The course includes the following contents: matrix, determinant, a system of linear equations, quadratic surfaces, functions of several variables, differential equations.

Physical Education 1 (202501) [1: 45-0-45]: Providing student knowledge of Athletics; Principles and methods of practicing Athletics in particular, sport practicing in general.

Academic English 2 (213604) [3: 45-45-0]: Improve and complete basic grammar sections. New knowledge of exam questions, exam contents, skills for English test at the intermediate level.

Introduction to Informatics (214103) [3: 60-30-30]: Providing for student basic knowledge of computer science and such software as Word, Excel and internet; helping



students understand how to use computer correctly and can apply software in their learning process effectively.

Ho Chi Minh Ideologies (200107) [2: 30-30-0]: This course consists of 6 chapters, providing students with basic knowledge about concepts, objects, research methods and learning meanings of Ho Chi Minh Ideologies; this subject focus on the basis, and process of formation and development of Ho Chi Minh Ideologies; explaining the Ho Chi Minh's Ideologies on: National independence and socialism; The Communist Party of Vietnam and the State of the people, by the people, for the people; great national and international solidarity; culture, people; morality.

Mathematic Probability and Statistics (202121) [3: 45-45-0]: Probability and statistics are two closely related fields in mathematics. It is important because of its direct application in areas such as genetics, technology, finance... This course introduces probability theory and statistics. Topics covered are probability axioms, conditional probability; Bayes' theorem; discrete random variables, probability generating functions, standard discrete distributions; continuous random variables, uniform, normal, Cauchy, exponential, gamma, and chi-square distributions, random sample, parameter estimation, statistical hypothesis testing, and correlation and regression.

History of Vietnam Communist Party (200105) [2: 30-30-0]: The Vietnam Communist Party History module is part of the knowledge block, providing students with a systematic and knowledge base about the life of the Communist Party of Vietnam and the revolutionary leadership process from 1930 to 2020. Beside the introductory, the course content 3 chapters:

- Chapter 1st: The life of the Communist Party of Vietnam and its leadership in the struggle for power (1930 - 1945).
- Chapter 2nd: to lead the two wars for complete independence, reunification (1945 - 1975).
- Chapter 3rd: the national leadership's transition to socialism and the process of changing companies (1975 - 2020).

Swimming* (202503) [1: 45-0-45]: This course provides students with an overview of the history of sport development and the Olympic movement, the benefits of physical training and the principles and methods of physical training. Swimming is the most enjoyable and rewarding sport that anyone can participate in. Swimming is not like



running, cycling, lifting weights or other activities, because it is ideal for all ages or fitness levels. No other sport can surpass swimming in helping to strengthen the whole body, calm the mind, improve breathing, stimulate circulation and do not strain the joints.

Introduction to Vietnamese Law System (202622) [2: 30-30-0]: General law is a basic science subject, aiming to provide learners with general knowledge, basic, main and most general knowledge about the State and the law. This course will provide students with basic knowledge on: i/ Knowledge of the practical law of the basic legal branches of the Vietnamese legal system and international law as well as the implementation of the law and handling of violations of the law; ii/ Helping learners create a foundation for the study of other specialized legal sciences and contribute to improving the legal culture and legal consciousness of citizens, voluntarily implementing the law, living habits and work in accordance with the Constitution and the law; iii/ Know how to choose behaviors and assert their autonomy in social relations, at work, in daily life as well as know how to protect their own legitimate rights and interests.

4.1.2 Elective courses - accumulated at least 4 credits

Analytical Chemistry (202302) [2: 30-30-0]: Analytical chemistry course is to introduce qualitative and quantitative chemical analysis of organic and inorganic compounds in common sample matrices like water, air, and soil. This course will provide students with a broad understanding of the different steps in the analytical process such as sampling, sample preparation, chemical and instrumental analysis, evaluation, interpretation and reporting of analytical results. Furthermore, this course also includes the theoretical principles and important applications of classical analytical methods within titration such as acid/base titration, complexometric titration, redox titration, precipitation titration, and various techniques within gravimetric methods, spectrophotometric methods.

Analytical Chemistry Practice (202305) [1: 30-0-30]: The laboratory course provides hands-on experience in quantitative analysis. After experiments, the student could be able to: i/ Understand the theoretical principles and important applications of classical analytical methods within titration such as acid/base titration, complexometric titration, redox titration, precipitation titration, and various techniques within



gravimetric methods, spectrophotometric methods; ii/ Perform classical analytical experiments and making observations and assessments of important factors that could affect the analytical result, iii/ Be familiar with calculations in analytical chemistry and perform statistical evaluation of results from classical chemical experiments. - Make scientific reports from chemical experiments and present the results in a transparent manner; iv/ Give a general understanding in how to work safely in the laboratory.

Biodiversity (202403) [2: 30-30-0]: The course will provide learners with basic content such as concepts, structure, function and characteristics of genetic, species and ecosystem diversity. Learners will know how to understand the characteristics of the taxonomy and arrangement of species, taxon and taxa. Moreover, learners can understand the role and value of biodiversity for aquatic ecosystems, ecological environment, and human habitat. Finally, learners will analyze the causes leading to biodiversity degradation and effectively apply the forms of biodiversity conservation. From the equipped content, learners can apply knowledge in aquaculture practice and protect environmental resources for sustainable development.

Introduction to Sociology (202621) [2: 30-30-0]: Sociology is a science that studies the general laws of the existence, operation and development of society, social relationships, and the interaction between the basic components of society. Study society as a whole. Explain and analysis of basic concepts such as culture and society, socialization and social interaction, social groups and organization, inequality and social stratification, etc. Society Science provides people with knowledge and understanding of: social things and individual behavioral patterns, the workings of the social systems in which we live, helping us to understand why social change and how to change society. Throughout the sociological research methods, provide student the methods of conducting a sociological investigation, about the methods of information collection; Based on theories and acquired knowledge, sociology equips learners with scientific knowledge about social fields and skills to apply them to research and solve real problems.

Communication Skills (202620) [2: 30-30-0]: The course is designed to provide students with basic knowledge by combining practical exercises inside and outside of classroom on the principles of behavior in communication with different contexts, which results in positive attitude and confidence in communication in order to achieve the



highest communication efficiency, as well as the influence of this attitude on other objects in the communication process. This module plays an important role in forming one of the soft skills systems for students, contributing to improving career capacity at all levels.

Introduction to Management (208416) [2: 30-30-0]: Provides basic knowledge of management studies applied in business such as: the nature of management, the object of management, the purpose of management, the functions and tasks of management. The course also studies the functions of management such as: Operations and production management, business environment, business decisions, strategic planning, human resource management and some management issue such as: change management of an organization, conflict management, risk management.

4.2 Fundamental Courses

4.2.1 Required courses

General Biochemistry (203104) [3: 60-30-30]: The course provides students with knowledge about the morphology, properties, molecular mechanisms and pathways of metabolizing substances in living organisms such as enzymes catalytic mechanism; tissue respiration; mechanism of photosynthesis in plants; mechanism of transporting substances through cell membranes; supplies and reserves, energy conversion pathways; intermediate stages in the degradation and synthesis of carbohydrates, lipids, proteins and nucleic acids; preservation and transmission of genetic information. With this knowledge, students can easily acquire and understand more deeply the other basic subjects and related subjects such as: Food chemistry, Microbiology, Storage and Food processing, etc. Beside theoretical content, this subject also has practical session to help student approach and become familiar with laboratory activities in the field of biochemistry

General Genetics (203203) [3: 60-30-30]: The course includes content related to genetic structure and materials; replication, transcription and translation of DNA; the interaction and formation of phenotypes from genotypes under the influence of environmental factors; regulating mechanism and gene expression of organisms; genetic changes; genetic engineering and cell technology. The course provides principal genetic so that learners can study other subjects related to this field. In addition, the course has

a practical section to help students approach and familiarize themselves with laboratory manipulations in the field of genetics.

Introduction to Fisheries Science (206109) [2: 30-30-0]: This course is designed including following basic contents: i/ Overview on potentials and current status of fisheries sector of Viet Nam, ii/ Basic knowledge on habitat conditions and main bio-characteristics of fish and shrimp species, iii/ Currently major and common aquaculture systems in Viet Nam, and iv/ Basic principles of technologies of seed and marketable production of important cultured animals such as marine shrimps, freshwater and marine fishes. Moreover, the information on technical advances in the fisheries sector of the country is also included to give a general picture on research and production activities of the sector.

Aquatic Botany (206114) [3: 60-30-30]: This course provides basic knowledge in: i/ General introduction for aquatic plants, especially algae, and factors influence their life, ii/ Some common algae groups, iii/ The role of algae in nature as well as aquaculture and algal culture systems, iv/ Harmful algae. Based on that, the student can master other specialized subjects and apply the knowledge into practice after graduation.

Water Quality Management in Aquaculture (206103) [3: 60-30-30]: The course covers the issues of the water sources used in aquaculture; physical and chemical properties and the effects of these factors on the aquatic life. The module also provides learners with knowledge of water quality management methods in aquaculture and models of water reuse or recirculation water systems. In addition to the theoretical content, the module builds case exercises on the treatment when the water quality factors fluctuate in a bad direction. The course also equips students with basic knowledge of chemical analysis, the use of test kits to analyze pond water quality parameters and water quality assessment methods.

Zooplankton and Benthos (206105) [3: 60-30-30]: The course provides students with basic knowledge on: i/ General information about zooplankton and zoobenthos, and the factors impacting on their life; ii/ The common zooplanktons; iii/ The role of zooplankton in nature and in aquaculture; iv/ The common zoobenthos; v/ The role of zoobenthos in nature and in aquaculture. Furthermore, this course will also provide students with updated information on studies and zooplankton culture as a natural feed



source in Vietnam. After the course, the students will be able to grasp other related subjects in their study program, and then be capable of applying the knowledge they learned into practice.

Ichthyology (206106) [3: 60-30-30]: The overall focus of the course is on providing knowledge about ichthyology such as external morphology, anatomy, taxonomy, evolution and geographical distribution of fish.

Specialized Biochemistry for Fisheries (206316) [2: 30-30-0]: The course includes a basic metabolism and energy of cells in aquatic animals. The major content of the course explains the biochemical reactions that take place in the aquatic animal bodies such as absorbing nutrients, eliminating substances, or exchanging nutrients and energy of the body with the living environment. For example, exchanging bioenergy, protein, lipid, carbohydrates, minerals and vitamins, and nucleic acids.

General Microbiology (203516) [3: 60-30-30]: The course is designed to provide students with general knowledge about the main groups of microorganisms (acellular agents, prokaryotes and eukaryotes) as well as cell structures and reproduction of those microorganisms. The course also introduces microbiological physiological characteristics, nutritional requirements and environmental factors that affect the growth and reproduction of microorganisms.

Physiology of Aquatic Animals (206115) [4: 75-45-30]: The overall focus of the course is on providing knowledge about mechanism of activation and functional role of internal organs in aquatic animals (physiology of blood, respiration physiology, excretion, nutrition and metabolism, reproduction...). The main animal groups that will be considered are fishes, crustaceans and mollusks. It will be useful to understanding the essence of rules, modes of regulating the activities of each organ inside aquatic animals with interaction between environmental factors and aquatic animals.

Statistics and Experimental Design (206116) [3: 60-30-30]: This course is designed to provide the students with fundamental knowledge of sampling and the use of statistics in collecting and exploring aquaculture experimental data as well as statistical hypothesis tests. The course will also introduce elements of experimental design and analysis of variance (one factor and two factors), correlation and simple linear regression. Students will also learn statistical software used in experimental data analysis procedures in the Excel and Minitab software package. The course will consist



of 3-hour weekly lecture, 6-hour weekly practical and one class devoted to student presentations related to a term project assigned at midterm.

Nutrition and Feed Technology in Aquaculture (206215) [4: 75-45-30]: The course provides basic knowledge on the role of different nutrients in aquafeed and their effects on the performances of aquatic animal species. Furthermore, knowledge and practical skills related to feed formulation and nutrient analysis techniques have also been provided through practical session.

Introduction to Aquatic Animal Pathology (206301) [2: 30-30-0]: The aim of the course on general disease of aquatic organisms is to introduce the students into the general knowledges both in the aquatic pathology and pharmacology, basic concepts of pathology and immunology, infectious and non-infectious diseases in aquatic animals.

Introduction to Fisheries Law (206420) [2: 30-30-0]: The course is designed to introduce students to the fishery law of Vietnam, by law documents guiding the law and current basic international treaties related to fishery activities including: aquaculture and fishing, aquatic products process, import and export, aquatic resources development and conservation, aquatic animal disease inspecting and control. In addition to the theoretical content, the course also provides case studies to equip learners with skills to apply the law in solving problems related to the fisheries practice.

Introduction to Aquatic Products Preservation and Processing (206520) [3: 60-30-30]: The course is designed to provide the students with general knowledge on preservation processes of aquatic raw materials and final aquatic products; processing processes of traditional aquatic products and value-added aquatic products; the methods to develop new aquatic products from raw materials

4.2.2 Elective courses - accumulated at least 5 credits

Entrepreneurship (206424) [2: 30-30-0]: The Entrepreneurship module includes terms and problems commonly encountered when young people start a business in agriculture, especially in aquaculture, the module also provides learners with the basic principles, how to plan Business plan, Canvas model, market analysis skills, skills to learn about customers, competitors or current startup models.

In addition to the theoretical content, the module builds real-world business case exercises that require students to think and handle situations. Besides, the course also



equips learners with basic knowledge about agribusiness such as skills in selling or marketing agricultural products,

Aquatic Ecology (206113) [3: 45-45-0]: This course includes 2 parts, part 1- Freshwater ecology and part 2- Brackish water ecology.

Part 1 will provide basic knowledge about water environment and types of water bodies, individual life of aquatic organisms, community life of aquatic organisms, some common freshwater ecosystems.

Part 2 will provide general knowledge about estuarine ecologies, including major ecosystems and their biodiversity, dynamics in water environment and aquatic life, characteristics of soil in estuary. Details in structure, function and eco-services of estuarine ecosystems will be introduced. It will then introduce sustainable management measures for these estuarine ecosystems.

Research Methods for Fish Biology (206117) [2: 40-20-20]: This course provides knowledge in: i/ Researching – Concept and design; ii/ Method of writing research concept and research project; iii/ Researching method for Fisheries Classifying, Genetic, Nutrition, Reproduction, Diagnose disease, Toxicology. Based on that, the student can master other specialized subjects and apply the knowledge into practice after graduation.

Introduction to Fishing Technology (206402) [2: 30-30-0]: The course introduces general knowledge about fishing and fishing grounds, fishing boats, composition and structure of fishing gear, principles of fishing gear manufacturing, main fishing sectors such as trawl nets, surrounding nets, hooks and lines, gill nets, seine nets and trappings, and international and Vietnamese fishing regulations and laws.

4.3 Specialized Courses

4.3.1 Required courses

English for Aquaculture (206214) [2: 30-30-0]: The course includes scientific articles and text related to aquatic animal biology, aquaculture concepts, environmental management in aquaculture, nutrition, and general shrimp health. The course also provides glossary of aquaculture

Marine Fish Culture Techniques (206205) [2: 30-30-0]: The course provides students with an overview of marine fish farming, techniques for culture marine fish in ponds and in cages. Students are also introduced to the high economic value of marine





fish farming techniques. In addition, the subject also equips students with knowledge about the environmental impacts of marine fish farming systems and management measures to minimize adverse impacts on the environment.

Freshwater Fish Culture Techniques (206216) [3: 60-30-30]: The course is designed to provide learners with operating skills and management methods for popular freshwater aquaculture systems in Vietnam, the advantages and disadvantages of each culture system, and the main factors affecting the effectiveness of these systems such as geographical, climatic, economic and human resources.

Fisheries Economics (206405) [2: 30-30-0]: The Fisheries Economics is on providing basic principles in economic, concepts those related to supply, demand and price of aquatic products. It also provides the methods for analyzing an aquatic production costs and economic efficiency those can be used improve the ability to analyze and evaluate production management and finance in fisheries company. Furthermore, the concepts, stages and concerned issues of farming business planning process will be introduced in this course.

Fish Seed Production Techniques (206217) [4: 75-45-30]: This course is designed including basic contents on mechanisms of vitellogenesis, oocyte maturation and ovulation, and spawning in fish; factors affecting gonadal maturity and spawning of fish; principles of maturity culture, spawning induction and fingerling nursing of fish; principles of fish seed transportation; technologies and advances in fish seed production; and factors affecting and solutions improving fish seed quality. Moreover, the course also provides exercises on building technical procedures and solutions of problems in reality of fish seed production.

Crustacean Seed Production and Culture Techniques (206218) [4: 75-45-30]: Crustaceans seed production and culture course include basic knowledge on hatchery and grow-out farms of some important and valuable crustacean species in Vietnam such as black tiger shrimp, white leg shrimp, giant freshwater prawn, and mud crab. This course provides the students with awareness and skills on how to produce crustacean seeds in the hatchery. It also supports students who know how to culture the crustacean seeds in the commercial grow-out farms

Molluscan Seed Production and Culture Techniques (206219) [3: 50-40-10]: The course provides basic knowledge on biological characteristics, seed production and



culture techniques of high economic value mollusk species such as green mussel, pearl oyster, oyster, clam and blood cockle. Furthermore, knowledge on other aspects of mollusk culture such as effective conservation and natural seed collection method, appropriate culture site selection, product depuration after harvesting to meet high quality and food safety standards has also been provided throughout the course.

Aquaculture Engineering (206221) [3: 60-30-30]: This course is designed to provide learners with knowledge on design methods, working mechanisms and operation of systems of canals, dams, inlet and outlet sluiceways; and on designing farming facilities of ponds, cages, recycling systems in aquaculture; treatment systems of supply water and wastewater; seed hatcheries; etc. Moreover, the course also introduces world technological advances in aquaculture engineering could be applied in accordance with conditions and current status of development of Vietnam aquaculture to ensure best exploit of potentials and competitive advantages of the country aquaculture sector.

Field Practice for Freshwater Aquaculture (206814) [4: 120-0-120]: The course includes practical content on techniques and management of production of freshwater aquaculture products of high economic value. Through internships at production facilities, students will improve practical skills, practical experience and update technical advances in production, helping students to actively apply in production practice production as well as research in the field of freshwater aquaculture.

Shrimp Diseases (206307) [3: 60-30-30]: The course includes contents describing diseases that occur frequently in shrimp cultured in Vietnam, Southeast Asia and around the world. In particular, the causes of disease, clinical signs, epidemiology, diagnostic methods, and disease control and prevention measures applied to farmed shrimp are specifically mentioned for each disease. This course also provides methods for evaluating shrimp health, checking for lesions, and the presence of common pathogens in shrimp as well as water environment.

English for Aquatic Animal Pathology (206315) [2: 30-30-0]: The course includes fundamental and practical knowledge related to technical English applied in aquaculture and aquaculture pathology.

Fish Diseases (206319) [4: 75-45-30]: The aim of the course on fish diseases is to introduce the students into the modern knowledges both in the infective fish diseases and environmentally and farming technologically influenced health condition of fishes.

After a brief introduction into the anatomy and physiology of farmed fishes, detailed information on infective (viral, bacterial, fungal, parasitological) and non-infective diseases are going to provide in detail.

Field Practice for Brackish water and Marine Aquaculture (206815) [4: 120-0-120]: The field practice for brackish water and marine aquaculture includes practice on techniques and management of the valuable aquatic animals in the hatcheries or grow-out farms. Through internships at production facilities, students will improve practical skills and experience, and update technical advances in production, helping students to apply actively in production practice as well as research.

4.3.2 Elective courses - accumulated at least 9 credits

Fisheries Extension (206406) [2: 30-30-0]: The course is designed to provide learners with basic knowledge about concepts, approaches and methods for effective transfer of technology from its source of origin (research) to ultimate users (the farmers) and securing its adoption

Health Management of Aquatic Animals (206312) [2: 30-30-0]: The course is designed to introduce students to the concepts of disease in populations, the major aquatic disease causing pathogens, the risks that may address impacts on aquatic animal health and the options for control. The course is specifically tailored for the student to understand the biosecurity plan and implement it into practice, to identify and diagnose common diseases related to inappropriate management.

Fisheries Production Management (206421) [2: 30-30-0]: The fisheries production management course equips students with the basic principles of management in production. The course provides learners some content such as methods of forecasting production demand, identifying locations for building businesses, material management, inventory management, etc. In addition, the course also provides case studies, demonstrates for production management activities and practical experiences.

Aquatic Resources Management (206426) [2: 30-30-0]: The course introduces general issues on fisheries resources and environment, biological and socio-economic multi-factor relationships in fisheries resource management. The module also provides





assessment methods, tools and measures for managing and management decision making of fisheries resources.

Ornamental Fish Diseases (206313) [2: 45-15-30]: The aim of the course on ornamental fish diseases is:

- To introduce the students in a general information of ornamental fish diseases and housing technologically influenced health condition of ornamental fishes.
- To provide detailed information on infective and non-infective diseases in culture of ornamental fish.

Planning and Management of Fisheries Development (206404) [2: 30-30-0]: This course will introduce the status of production and management in aquaculture; concepts and requirements for planning and sustainable development in aquaculture. It will then introduce the principles in conducting a planning project for aquaculture development; Tools and methods to be used in conducting a planning project. Finally, it will provide the general process and detail steps in planning an aquaculture project.

Aqua-business Management (206427) [3: 45-45-0]: The module equips students with the basic principles of production and business management of fishery products. In addition, the basic principles of inventory management, quality management, the process of making business decisions and business strategies will be discussed in this subject. Methods of analyzing production costs also help students improve their ability to analyze, forecast demand and consider the basics of financial management in fisheries corporations. Besides, some concepts of quality management are also introduced in this course to help students improve their knowledge of comprehensive quality management in fisheries business and production.

Environmental Impact Assessment in Fisheries (206429) [3: 60-30-30]: The main contents of this course comprise basic knowledge on environmental impact assessment, including concepts, compositions and states of environment; environmental impact assessment (EIA) and its significance; a requirement and project classification for EIA; general process to run an EIA; requirement for structure and content of an EIA report, particularly into aquaculture field. Additionally, it also provides some related regulations in reviewing and evaluating an EIA report. Finally, a field trip will be organized for students to learn how an aquaculture sector sets up their environmental management system; and they will practice developing an EIA proposal for assessing



the impacts of a real-world production.

Applied Genetics in Aquaculture (206210) [2: 30-30-0]:** The course includes content related to genetic materials, the law of genetics, variation of genetic material in aquatic animals, methods of crossbreeding and selection in fish, and the modern molecular genetic techniques applied in fisheries. In addition, the course also provides a number of published research results related to the field of genetics and breeding of aquatic species to illustrate the achievements and practical experiences. Thereby, students will gain background knowledge and fundamental knowledge related to the key areas of genetics and genetic applications in fisheries.

Ornamental Fish Culture Techniques (206220) [2: 40-20-20]:** The course is designed to provide learners with knowledge about: an overview of the situation of ornamental fish farming in the country and in the world; biological, reproductive, nutritional, distribution and habitat characteristics of freshwater and marine aquarium species; the farming and breeding techniques for some popular ornamental fish species. The course also provides theoretical and practical foundations in the design and operation of aquariums.

Applied Microbiology in Aquaculture (206303) [2: 30-30-0]:** This course will provide students with knowledge in microflora of healthy aquatic animals and water environment, beneficial microorganisms with applications in aquaculture and pathogenic microorganisms. The course also equips students with basic applications of microbiology in the study of aquatic pathogens, biological products in aquaculture such as probiotics, vaccines and immunostimulants.

Drugs and Chemicals in Aquaculture (206310) [2: 30-30-0]:** This course will provide to students with basic knowledge about principles of application of chemicals and drugs in aquaculture. In addition, this course also provides students with concepts, pathways, processes, and metabolic control principles in aquaculture ponds and on the animals. These knowledges will establish a foundation for students and help them master other subjects as well as allow them applying the knowledge into practice after graduation.

Fisheries Marketing (206409) [2: 30-30-0]:** This course equips learners with basic knowledge relating to marketing, such as: marketing principles in business, methods of research and analysis market, marketing strategies, some concepts on



international marketing to help assess global market issues. Accordingly, learners develop basic marketing knowledge and understand the applications of marketing in business. The students will have skills to analyze marketing in an organization or industry and building an appropriate marketing strategy for companies.

Quality Assessment for Aquatic Products (206513) [2: 30-30-0]:** The course introduces students the concepts and methods of qualitative and quantitative assessment of aquatic products according to Vietnamese and international standards based on the three groups of criteria including microbiological tests, chemical test and sensory evaluation. In addition, the course also updates several innovative methods that are not in the list of standards but are now commonly applied in quality assessment for aquatic products.

4.3.3 Elective courses - accumulated at least 12 credits

Minor Thesis (206904) [6: 90-0-90]: Minor thesis is considered an important scientific work of students, in order to evaluate the ability to apply integrated knowledge accumulated during the training process; thinking and reasoning skills; self-study and self-research attitude of students in order to solve the requirements of applying theory to practice in aquaculture activities. Minor thesis are organized with an internship period of 10-15 weeks. The content of the minor thesis is structured into four main parts, including: (1) Introduction, (2) Research methodology, (3) Results and discussion, and (4) Conclusion and recommendations.

Thesis (206905) [12: 180-0-180]: Training students to plan, develop and complete specific research in the field of aquaculture as well as enable students to synthesize, practice and perfect all knowledge, experience and skills for flexible access to future employment.

Special study on Aquatic Resources Management (206910) [2: 30-30-0]: The study provides students with the skills to write an overview research report in the field of fisheries resource management, including identifying issues and priority topics, assessing the significance and urgency of the research, define special study objectives, literature review, analyze and propose solutions.

Special study on Diseases of Aquatic Organisms (206911) [2: 30-30-0]: The course provides student with knowledge and methodologies for writings about topics related to aquaculture pathology. Student will be guided with methodology for literature reviews

of relevant issues. All references will be summarized, organized, and rewritten into a complete document summarizing analyzing the published results

Special study on Aquatic Animal Health Management (206912) [2: 30-30-0]: In the Special Study on Aquatic Animal Health Management course, participants are required to write a report in order to explore, synthesize, analyse research data, and propose their new research idea related to the concepts of disease in populations and disease diagnostics, the risks that may address impacts on aquatic animal health and the options for control.

Special study on Fisheries Trading (206913) [2: 30-30-0]: The Special Study on Fisheries Trading module equips students with the skills of making a general research report in the commercial fisheries field, including determining priority problems and topics, evaluating the importation, urgency and meaning of topics, defining thematic objectives, reviewing documents, analyzing and propose solutions.

Special study on Aquatic Products Research and Development (206914) [2: 30-30-0]: This special study equips students with skills in researching, searching and synthesizing knowledge from literature to develop new seafood products. In addition, the special study also helps students to identify objectives, content, and concerned issues in developing new seafood products.

Special study on Aquatic Products Hygiene and Safety Assurance (206915) [2: 30-30-0]: This special study is designed to equip students with knowledge, skills and approach to conduct scientific research on hygiene and safety of aquatic products. In addition, this course also helps student to be able to apply knowledge to solve practical problems in food hygiene and safety of aquatic products

Special study on Aquatic Products Quality Assurance (206916) [2: 30-30-0]: This special study equips students with skills in researching, searching and synthesis knowledge from literature to manage and ensure the quality of aquatic products. In addition, the special study also helps students to identify objectives, content, concerned issues and building the approach to manage and ensure the quality of aquatic products.

Special study on Aquaculture Techniques (206917) [2: 30-30-0]: This course is designed to train students to be able to search, select, and synthesize documents related to farming techniques, culture systems of different value aquatic species; update advanced technologies in the field of aquaculture. In addition, students are also equipped

with skills to organize, write and present thematic reports. Thereby, students are trained in skills and responsibility for lifelong self-study and research.

Special study on Aquatic Seed Production Techniques (206918) [2: 30-30-0]:

This subject helps students to be able to look up, select and synthesize references related to valuable aquatic species seed production techniques; It also updates technical advances and modern science of seed production from domestic as well as foreign sources. In addition, students improved their organizing, writing, and presenting skills under the evaluation committee. Thereby, students can be active in self-study and research.

TEACHING AND LEARNING METHOD

Educational philosophy: Liberation – Responsibility – Innovation

Liberation: The Spirit of Liberal Education at FoF is an educational philosophy aimed at creating people with a sense of innovation, responsibility and independent liberal thinking that accept diversity and differences.

Responsibility: FoF's students are given and accept a high level of responsibility to self, to others and to the community. We act with responsibility when we do our job well and help others do the same. We take responsibility for our mistakes that we can learn from them and even translate them into success.

Innovation: We continuously introduce creative change with the purpose of constantly improving and being responsive to the times.



SOME TEACHING METHODS HAVE BEEN APPLIED

- **Lecture:** Some general knowledge courses have many students in the classroom. Therefore, lecturers usually give explanations and examples directly in class and students can contribute to the lesson whenever they have ideas. Good note taking and synthesis skills are required in learning by this method.



- **Seminar and teamwork learning:** Students are divided into small groups to solve a problem or present a specific topic related to the lesson. This method requires a hard-working spirit and self-learning awareness's from each member of the group. Students have to spend time working on their own or discussing with other members of the group to find out the solutions. Students usually get many experiences from this learning method especially the ones that support teamwork skills such as communication, group management and division, oral presentation skills, time management, etc.



- **Group discussion/debate:** students are divided into small groups and work together to find out the answers to the questions raised at the beginning of the lesson. These small groups can discuss or debate together to deeply learn about the lesson. Not only this method helps to enhance the brainstorming but it also stimulates the critical thinking of the students.



- **Project/research-based learning:** Students usually gain knowledge and skills during the time they work on the small project or research. This method is often used for teaching specialized courses which required deeper knowledge about academic fields. It also trains the students in some skills and techniques in working on the research such as: choosing appropriate methods, setting up the experiments, collecting and analyzing data, presenting the result, etc. The experiences that they get from this method are the sound foundation to help them do thesis research in the future.



- **Laboratory work:** This is the compulsory component of most of the fundamental and specialized courses. This component helps the students start to get familiar with laboratory techniques and research tools from basic to advanced steps.



ENGAGEMENT OF WORLD OF WORK (WoW)

In Training Programme

The strength of the AQUA programme is the clear and oriented engagement of WoW in education. Students have opportunities to approach WoW not only at the early stage (in the first and second academic year) but also during the time of the training programme. FoF has established long-term cooperation with companies, and organizations that mainly focus on the aquacultural field by periodically signing a Memorandum of Understanding (MoU). These MoUs guarantee the engagement of WoW in training students directly or indirectly through activities such as mentoring,



giving invited lectures in seminars, supporting scholarships and the priority in recruitment.



Field Practice

The field practice is designed to reinforce and systematize learned knowledge about aquacultural at the different ecological systems in southern Vietnam. After the students finished the 3rd academic year, the field practice is designed as the compulsory course of the training programme in which students have to spend two months working at the workplace and learning how to process tasks in reality.



PROFESSIONAL SEMINAR AND CAREER ORIENTATION

During the training programme, students always have opportunities to access updated information related to aquaculture. Professional seminars are jointed in the programme to provide their knowledge of new technologies and information from specialists, human resources units from companies, government and non-government organizations, as well as crop production farms. Moreover, in some courses, students also have a chance to visit the production factories or farms to learn from reality.





CONTACT INFORMATION

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Academic Staff and Supporting Staff

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Dean	Dr. Nguyen Nhu Tri	nntri@hcmuaf.edu.vn	Mollusks culture technique, aquatic animal nutrition
Vice Dean	Dr. Nguyen Hoang Nam Kha	kha.nguyen@hcmuaf.edu.vn	Antibiotic resistance, aquatic product processing, safety, quality assurance



PROGRAMME SPECIFICATION



Department of Aquatic Biology and Resources Management

Position/Title	Name	Contact	Research field
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Lecturer	Dr. Nguyen Phuc Thuong	npthuong@hcmuaf.edu.vn	Fish Biology, Bony fish skeletal deformity, Fish Anatomy, Fish biodiversity and conservation
Lecturer	MSc. Nguyen Thi Bach Mai	bachmai@hcmuaf.edu.vn	Aquatic Biology
Lecturer	MSc. Dang Thi Thanh Hoa	dtthoa@hcmuaf.edu.vn	Aquatic Biology
Lecturer	MSc. Nguyen Thi Thanh Truc	trucnguyents@hcmuaf.edu.vn	Biology of Aquatic animals
Lecturer	MSc. Le The Luong	luong.lethe@hcmuaf.edu.vn	Genetics, Application of Genetics in Aquaculture, Biotechnology, Gene Technology, Cell Technology, Biochemistry.
Academic Affair staff	MSc. Tran Hong Thuy	hongthuy_kts@hcmuaf.edu.vn	Welcome and support students, lecturers related to Academic affairs.





PROGRAMME SPECIFICATION



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Lecturer	Dr. Ho Thi Truong Thy	thy.hothitruong@hcmuaf.edu.vn	Bacterial pathology in aquatic animal, probiotics in aquaculture, Immunity in aquatic animal
Lecturer	Dr. Vo Van Tuan	vovantuan@hcmuaf.edu.vn	Aquatic animal diseases
Lecturer	Dr. Tran Huu Loc	thloc@hcmuaf.edu.vn	Aquatic animal Pathology, Genetics, Biotechnology applied in Aquaculture.
Lecturer	Dr. Nguyen Thao Suong	suong.nguyenthao@hcmuaf.edu.vn	Diseases in aquatic animals, Biological safety, Quorum sensing, Probiotics, - Omics
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Department of Aquatic Product Processing Technology

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Lecturer	Dr. Nguyen Hoang Nam Kha	kha.nguyen@hcmuaf.edu.vn	Antibiotic resistance, aquatic product processing, safety, quality assurance
Lecturer	MSc. Le Thi Ngoc Han	han.lethingoc@hcmuaf.edu.vn	Dried food, aquatic by-product processing, food products development, traditional aquatic products
Lecturer	MSc. Nguyen Thuy Linh	ntlinh@hcmuaf.edu.vn	Food processing and preservation
Lecturer	MSc. Pham Thi Lan Phuong	ptlphuong@hcmuaf.edu.vn	Antimicrobial agents for aquatic product preservation
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PROGRAMME SPECIFICATION



Department of Aquaculture Technology

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Lecturer	Dr. Ong Moc Quy	quy.ongmoc@hcmuaf.edu.vn	Crustacean seed production and grow-out farming
Lecturer	Dr. Nguyen Thanh Tam	nthanhtam@hcmuaf.edu.vn	Aquaculture and aquatic resources management, Ecotoxicology
Lecturer	Dr. Nguyen Nhu Tri	nntri@hcmuaf.edu.vn	Mollusk culture technique, aquatic animal nutrition
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Supporting Staff	MSc. Tran Van Minh	minh.tranvan@hcmuaf.edu.vn	Aquaculture technology, Aquatic seed production
Supporting Staff	MSc. Ngo Dang Lam	ndanglam@hcmuaf.edu.vn	Experimental farm manager
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PROGRAMME SPECIFICATION



Department of Fisheries Management and Development

Position/Title	Name	Contact	Research field
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Lecturer	Dr. Vu Cam Luong	vcluong@hcmuaf.edu.vn	Aquaculture and aquatic resources management
Lecturer	MBA. Mai Dang Tien	tien.maidang@hcmuaf.edu.vn	Marketing, consumption behavior, business administration
Lecturer	MSc. Vo Thanh Liem	vthanhliem@hcmuaf.edu.vn	Fisheries production management



Supporting Staff

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Supporting Staff	MSc. Tran Van Minh	minh.tranvan@hcmuaf.edu.vn	Aquaculture technology, Aquatic seed production
Supporting Staff	MSc. Ngo Dang Lam	ndanglam@hcmuaf.edu.vn	Experimental farm manager
Supporting Staff	MSc. Truyen Nha Dinh Hue	nhahuets@hcmuaf.edu.vn	Lab manager
Supporting staff	MSc. Vo Thi Thanh Binh	vttbinh@hcmuaf.edu.vn	Lab manager