

### COURSE OUTLINE DETAILS

**1. Course: Shellfish aquaculture (Kỹ thuật nuôi giáp xác và nhuyễn thể)**

- **Code number:** AQ303

- **Credits:** 3

- **Hours:** 30 theory hours, 30 practice hours, and 60 self-study hours

**2. Management Unit:**

- **Department:** Coastal Aquaculture

- **Faculty:** College of Aquaculture and Fisheries

**3. Requisites:**

- **Prerequisites:** No

- **Corequisites:** No

**4. Course objectives:**

Objectives	Descriptions	Program Outcomes
4.1	To provide students with knowledge of the current status, challenges, potential and strategies for sustainable development of shellfish aquaculture in the world and in Vietnam; the biological characteristics of different cultured species of shellfish; technologies of different farming systems of shellfish species	2.1.2a 2.1.3a
4.2	To train students on how to prepare an aquaculture project proposal, and apply farming technologies to practical conditions of Vietnam and the Mekong Delta	2.2.1a
4.3	To improve skills in group work, information searching and report presentation.	2.2.2
4.4	To promote student's responsibilities in contribution to development of aquaculture in the region, scientific and practical attitude, self and long-life learning, and autonomy in their career.	2.3

## 5. Course learning outcomes:

COs	Descriptions	Objectives	POs
	<b>Knowledge</b>		
CO1	Generalize the status, trends and sustainable development of shellfish culture in the world and Vietnam	4.1	2.1.3a
CO2	Describe the biology and farming technology of shellfish, especially important species such as marine shrimp, freshwater prawn, mud crab, clam, oyster, blood cockle...	4.1	2.1.2a 2.1.3a
	<b>Skills</b>		
CO3	Practice on culture of important shellfish species, such as marine shrimp, freshwater prawn, mud crab, clam, oyster, blood cockle...	4.2	2.2.1a
CO4	Develop a project proposal for shellfish farming; how to work and present report in group effectively	4.3	2.2.2
	<b>Attitudes/Autonomy/Responsibilities</b>		
CO5	Graduated students have good attitudes in their careers, good capability and autonomy in planning and solving issues in aquaculture, and high responsibility in contribution to development of aquaculture in the region.	4.4	2.3

Note: "COs" means Course Outcomes; "POs" means Program Outcomes

## 6. Brief description of the course:

This course is one of the specialized courses in aquaculture academic program. The course introduces students the general information about the current status, roles and issues for sustainable development of shellfish aquaculture; introduces biological characteristics of shellfish species, and introduces farming technologies of important shellfish species. In addition, the course includes fieldtrips to visit different farming systems in the regions. The course approaches different methods to enhance learning capability of students.

## 7. Course structure:

### 7.1. Theory:

	Content	Hours	COs
<b>Chapter 1.</b>	<b>General introduction</b>	<b>3</b>	<b>CO1</b>
1.1.	Development and roles of crustacean culture in the world and in Vietnam		
1.2.	Development and roles of mollusk culture in the world and in Vietnam		
1.3.	Issues and strategies for sustainable development of crustacean and mollusk culture		

<b>Chapter 2.</b>	<b>Biology and culture of marine shrimps</b>	<b>18</b>	CO2, CO3, CO4, CO5
2.1.	Introduction about shrimp culture		
2.2.	Biology of marine shrimps		
2.3.	Semi-intensive and Intensive shrimp farming systems		
2.4.	Improve extensive shrimp farming systems		
2.5.	Integrated mangrove – shrimp farming systems		
2.6.	Alternative rice – shrimp farming systems		
<b>Chapter 3.</b>	<b>Biology and culture of giant freshwater prawn</b>	<b>6</b>	CO2, CO3, CO4, CO5
3.1	Introduction		
3.2	Biology of giant freshwater prawn		
3.3	Pond culture of giant freshwater prawn		
3.4	Alternative rice – prawn farming systems		
3.5	Integrated rice – prawn farming systems		
<b>Chapter 4.</b>	<b>Biology and culture of mud crabs</b>	<b>3</b>	CO2, CO3, CO4, CO5
4.1	Introduction		
4.2	Biology of mud crabs		
4.3	Grow-outs of mud crabs		
4.4	Fattening of mud crabs		
4.5	Soft-shell production of mud crabs		
<b>Chapter 5.</b>	<b>Biology and culture of Clam</b>	<b>3</b>	CO2, CO3, CO4, CO5
5.1	Introduction		
5.2	Biology		
5.3	Culture techniques		
<b>Chapter 6.</b>	<b>Biology and culture of Cockle</b>	<b>3</b>	CO2, CO3, CO4, CO5
6.1	Introduction		
6.2	Biology		
6.3	Culture techniques		
<b>Chapter 7.</b>	<b>Biology and culture of Oyster</b>	<b>3</b>	CO2, CO3, CO4, CO5
7.1	Introduction		
7.2	Biology		
7.3	Culture techniques		
<b>Chapter 8</b>	<b>Culture of other mollusks</b>	<b>6</b>	CO2, CO3, CO4, CO5
8.1	Biology of important species		
8.2	Culture techniques		

### 8. Teaching methods

Teaching methods include lecturing with PowerPoint, discussion and testing students in class; giving assignments; introducing and checking further reading or self study of

students. In addition, visiting shellfish farms will also be conducted to improve practical knowledge of students.

### 9. Duties of student

Students have to do the following duties:

- Attend at least 80% theory lectures
- Conduct all of group or individual reports
- Attend midterm and final exam
- Actively carry out self study activities
- Attend the fieldtrips to farm sites.

### 10. Assessment of course learning outcomes

#### 10.1. Assessment

No.	Point components	Rules and Requirements	Weights	COs
1	Individual assignment	Submit all of required reports	10%	CO1, CO2, CO3, CO4, CO5
2	Group assignment/ report and presentation	Attend and complete the group assignment / presentation	20%	CO1, CO2, CO3, CO4, CO5
3	Mid-term tests	Short tests with multiple choice or writing	10%	CO1, CO2, CO3, CO4, CO5
4	Final exam	- Writing + multiple choice (60 minutes) - Attend at least 80% theory lectures - Obligation	60%	CO1, CO2, CO3, CO4, CO5

#### 10.2. Grading

- Grading components and final test scores will be marked on a scale of 10 (0 to 10), rounded to one decimal place.
- Course score is the sum of all the components of the evaluation multiplied by the corresponding weight. The course score is marked on a scale of 10 and rounded to one decimal place, then it is converted to A-B-C-D score and score on a scale of 4 under the academic regulations of the University.

### 11. Learning materials

Learning materials information	Barcode number
[1] Arlo W Fast and L James Lester. Marine Shrimp Culture: Principles and Practices (1992). ELSERVIER. 862 pages	...
[2] DPI&F (2006) Australian Prawn Farming Manual, ACIAR, 2006. 159 pages ( <a href="http://aciar.gov.au/publication/cop001">http://aciar.gov.au/publication/cop001</a> )	

[3] FAO (2002) Farming freshwater prawns: A manual for the culture of the giant river prawn ( <i>Macrobrachium rosenbergii</i> ). 219 pages	
[4] FAO (2014) The State of World Fisheries and Aquaculture 2018. E-ISBN 978-92-5-108276-8 (PDF), 243 pages	
[5] Nguyễn Thanh Phương, Trần Ngọc Hải, Trần Thị Thanh hiền, Marcy Wilder, 2003. Nguyên lý và kỹ thuật sản xuất giống tôm càng xanh (Principles and technology for seed production of giant freshwater prawn). NXB NN, 138 trang	TS.004674
[6] Shelley, C.; Lovatelli, A., (2011) Mud crab aquaculture. No. 567. Rome, FAO. 2011. 78p. ( <a href="http://www.fao.org/docrep/015/ba0110e/ba0110e00.htm">http://www.fao.org/docrep/015/ba0110e/ba0110e00.htm</a> )	
[7] Spencer B.E. (2002) Molluscan Shellfish Farming. Blackwell Publishing, ISBN 0 85238 291-X: 274 pages.	639.96/S74 5; TS000789
[8] Ngô Thị Thu Thảo và Trương Quốc Phú. 2012. Giáo trình: Kỹ thuật nuôi Động vật thân mềm. 2012. Nhà xuất bản Đại học Cần Thơ. 136 trang	639.4/Th10 8; MOL. 068897
[9] Trần Ngọc Hải, Châu Tài Tảo, Nguyễn Thanh Phương, 2017. Giáo trình Kỹ thuật sản xuất giống và nuôi giáp xác (Text book – Seed production and farming technology for crustacean). NXB ĐHCĐ, 211 trang	TS.005489
[10] Trần Ngọc Hải, Nguyễn Thanh Phương, 2009. Nguyên lý và kỹ thuật nuôi tôm sú (Principles and culture technology of tiger shrimp). NXB NN, 203 trang	TS004143
[11] Trần Ngọc Hải, 2017. Nguyên lý và kỹ thuật nuôi cua biển (Principles and culture technology of mud crabs). NXB NN, 138 trang	TS005517

## 12. Self-study Guide:

Week	Content	Theory (hours)	Practice (hours)	Student's Tasks
1	<b>Chapter 1: General introduction</b>	3	0	Reading: Book [4], [8] Chapter 1 of [5], [9], [10], [11]
2-7	<b>Chapter 2: Biology and culture of marine shrimps</b>	18	0	Pre-reading: Book [1], [2], [8], [9], [10]
8-9	<b>Chapter 3: Biology and culture of giant freshwater prawn</b>	6	0	Pre-reading: Book [3], [5], [8], [9]

10	Chapter 4: Biology and culture of mud crab	3	0	Pre-reading: Book [6], [8], [9], [11]
11	Chapter 5: Biology and culture of Clam	3	0	Pre-reading: Book [7], [8]
12	Chapter 6: Biology and culture of Blood Cockle	3	0	Pre-reading: Book [7], [8]
13	Chapter 7: Biology and culture of Oyster	3	0	Pre-reading: Book [7], [8]
14-15	Culture of other mollusks	6	0	Pre-reading: Book [7], [8]

ON BEHALF OF RECTOR  
DEAN OF COLLEGE



Can Tho, 30/1/2022  
HEAD OF DEPARTMENT

  
Lê Quốc Việt