MINISTRY OF EDUCATION AND TRAINING
CAN THO UNIVERSITY

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

COURSE OUTLINE DETAILS

1. Course: Aquaculture Production **(Kỹ thuật nuôi trồng thủy sản)**
- **Code number:** AQ301
- **Credits:** 4
- **Hours:** 45 theory hours, 30 practice hours (fieldtrip) and 105 self-study hours

2. Management Unit:
- **Department:** Freshwater Aquaculture
- **Faculty:** College of Aquaculture and Fisheries

3. Requisites:
- **Prerequisites:** No
- **Corequisites:** No

4. Course objectives:

Objectives	Descriptions	Program Outcomes
4.1	Provide principle techniques in aquaculture and operate farming techniques for major cultured species based on different production systems	2.1.3 a
4.2	Develop the skill to solve the problem during management of aquaculture systems	2.2.1.a, b
4.3	Develop rational thinking, activeness, and confidence	2.2.2
4.4	Develop a positive attitude toward aquaculture production and strengthen habits of self-study and team working skills	2.3

5. Course learning outcomes:

COs	Descriptions	Objectives	POs
	Knowledge		
CO1	Recognize principle techniques of freshwater and marine aquaculture	4.1	2.1.3 a
CO2	Apply and operate farming techniques for major species (catfish, snakehead, tilapia, prawn, marine shrimp…) based on different production systems (ponds, cages, recirculation systems, enclosure,…)	4.1	2.1.3 a
	Skills		
CO3	Implement principle techniques of aquaculture production for commercial culture of economically valuable species	4.2	2.2.1.a

COs	Descriptions	Objectives	POs
	Knowledge		
CO4	Operate and solve the problem during management of aquaculture production systems	4.2	2.2.1.b
CO5	Develop skills in communication independent and team working for professional activities	4.2 4.3	2.2.2
	Attitudes/Autonomy/Responsibilities		
CO6	Develop a positive attitude toward aquaculture production	4.4	2.3
CO7	Strengthen habits of self-study	4.4	2.3

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

6. Brief description of the course:

Aquaculture production is a professional course to supply the knowledge on the status of world aquaculture and to evaluate aquaculture potential. The principle techniques of aquaculture include site and cultured species selection, pond management, fertilizer, water quality management, feeds and feeding, aquatic weed management, effluent management, fish transportation, harvesting, aquaculture production systems (ponds, cages, enclosure,…) will be in this course.

7. Course structure:

7.1. Theory

	Content	Hours	COs
Chapter 1.	**Introduction of aquaculture**	**2**	CO1
1.1.	Status of world aquaculture	0.5	
1.2.	Status of aquaculture in Vietnam	0.5	
1.3.	**Key definitions in aquaculture**	1	
Chapter 2.	**General aquaculture facilities**	**3**	CO1
2.1.	Ponds	1	
2.2.	Cages/net pen	1	
2.3.	Raceways	0.5	
2.4.	Recirculating system	0.5	
Chapter 3.	**Aquaculture checklist: site, species and business consideration**	**3**	CO1, CO3
3.1.	Site selection	1	
3.2.	Species selection	0.5	
3.3.	Business planning	1	
3.4.	Production planning	0.5	
Chapter 4.	**Water budgets for aquaculture production**	**2**	CO1, CO3, CO4
4.1.	Water budgets	0.25	
4.2.	Seepage and control	0.5	

4.4.	Evaporation	0.5	
4.4.	Water needs	0.5	
4.5.	Water conservation	0.25	
Chapter 5.	**Pond preparation**	**3**	CO1, CO3, CO4
5.1.	Liming	1	
5.2.	Fertilizing	1	
5.3.	Eliminating unwanted fish and insects	1	
Chapter 6.	**Water quality management**	**7**	CO1, CO3, CO4
6.1.	Dissolved oxygen	2	
6.2.	Ammonia	1	
6.3.	Nitrite	2	
6.4.	pH	1	
6.5.	Aquatic weed	1	
Chapter 7.	**Feed and feeding**	**5**	CO1, CO3, CO4
7.1.	Types of feeds	1	
7.2.	Feed quality and feeding factors	2	
7.3.	Feed management	2	
Chapter 8.	**Handling, grading, harvesting and transportation of fish**	**4**	CO1, CO3, CO4
8.1.	Handling fish	1	
8.2.	Grading fish	1	
8.3.	Harvesting fish	1	
8.4.	Transportation of fish	1	
Chapter 9.	**Aquaculture production species**	**10**	CO1, CO2, CO3, CO4, CO5, CO6
9.1.	*Pangasius* catfish: fry – market	2	
9.2.	Freshwater prawn	2	
9.3.	Tilapia	2	
9.4.	Marine shrimp	2	
9.5.	Snakehead	1	
9.6.	Climbing perch	1	
Chapter 10.	**Aquaculture production systems**	**6**	CO1, CO2, CO3, CO4, CO5, CO6
10.1.	Raceways	1	
10.2.	Cages	2	
10.3.	Ponds	1	
10.4.	Recirculating systems	2	

7.2. Practice

	Content	Hours	Cos
Unit 1.	**Field trip on freshwater aquaculture**	**15**	CO1, CO2, CO3, CO4, CO5, CO6, CO7
1.1.	Catfish (Pangasius, Clarias) intensive pond culture	6	
1.2.	Snakehead farming systems (earthen ponds, lined ponds, hapas)	3	
1.3.	Tilapia cage culture	3	
1.4.	Freshwater prawn farming in the rice field	3	
Unit 2.	**Field trip on brackishwater aquaculture**	**15**	CO1, CO2, CO3, CO4, CO5, CO6, CO7
2.1.	Semi intensive shrimp farming	5	
2.2.	Intensive shrimp farming	10	

8. Teaching methods:

- Class lectures
- Group discussion, presentation
- Observation aquaculture species and system
- Interview fish farmers (filling field trip questions)

9. Duties of student:

Students have to do the following duties:

- Class participation: 80%
- Fieldtrip participation: 100%
- Group reports

10. Assessment of course learning outcomes:

10.1. Assessment

No.	Point components	Rules and Requirements	Weights	COs
1	Participation	Attending 90% class hours Contributing to class and group discussion	0-10%	CO5, CO6, CO7
2	The first exam	Answer 20 – 30 short questions	40-50%	CO1, CO2
3	The final exam	Answer 30 – 40 short questions	50%	CO2,CO3, CO4, CO5, CO6, CO7

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] Teaching hand-out	
[2] Lacas, JS. and P.C. Southgate (Eds) (2003). Aquaculture: Farming aquatic animals and plants. Fishing News Books.	TS000867 (639.8.A656)
[3] Egna, H.S. and C.E. Boyd (1997). Dynamics of pond aquaculture. CRC Press.	TS005715 (639.3/D994)
[4] Pillay, T.V.R. and M.N. Kutty (2005). Aquaculture Principle and Practices. Blackwell Publishing	TS001591 (639.8 P641)

12. Self-study Guide:

Week	Content	Theory (hours)	Practice (hours)	Student's Tasks
1	Chapter 1. Introduction of aquaculture Chapter 2. General aquaculture facilities (2.1 – 2.2)	2 2		Have to read Chapter 1 and chapter 2 (2.1 – 2.2) in the handouts
2	Chapter 2. General aquaculture facilities (2.3 - 2.4) Chapter 3. Aquaculture checklist: site, species and business consideration	1 3		Have to read chapter 2 (2.2 – 2.4), chapter 3 in the handouts and learning material [4] page 27-55.
3	Chapter 4. Water budgets for aquaculture production Chapter 5. Pond preparation (5.1, 5.2)	2 2		Have to read chapter 4 and 5 (5.1 and 5.2) in the handouts and learning material [3] page 73-103 and 155-160.
4	Chapter 5. Pond preparation (5.3, 5.4) Chapter 6. Water quality management (6.1, 6.2)	2 2		Have to read chapter 5 (5.3 and 5.4) and chapter 6 (6.1, 6.2) in the handouts and learning material [3] page 55-57; 62-64.
5	Chapter 6. Water quality management (6.3 - 6.5)	4		Have to read the handouts in advance and learning material [2] page 47 – 73; learning material [4] page 246-252.
6	- Chapter 7. Feed and feeding (7.1, 7.2, 7.3)	4		Have to read the handouts in advance and learning material [2] page 172-198; learning material [3] page 245-260; learning material [4] page 162-168.
7	- Chapter 7. Feed and feeding (7.3 cont.)	1 3		Have to read chapter 7 (7.3), chapter 8. (8.1 – 8.3) in the

	- Chapter 8. Handling, grading, harvesting and transportation of fish (8.1 – 8.3)			handouts and learning material [3] page 215-235.
8	- Chapter 8. Handling, grading, harvesting and transportation of fish (8.4) - Chapter 9. Aquaculture production species (9.1) - The first exame	1 2 1		Have to read chapter 8. (8.4) and chapter 9 (9.1) in the handouts and learning material [4] page 260-271. Review all lectures to the first exame
9	Field trip on freshwater aquaculture (2 days)		4	Group working: have to read field trip questions in the handouts
10	Field trip on brackishwater aquaculture (2 days)		4	Group working: have to read field trip questions in the handouts
11	Chapter 9. Aquaculture production species (9.2, 9.3)	4		Have to read chapter 9 (9.2, 9.3) in the handouts and learning material [2] page 321-345, 436-441; learning material [4] page 400-415.
12	Chapter 9. Aquaculture production species (9.4-9.6)	4		Have to read chapter 9 (9.4-9.6) in the handouts and learning material [2] page 382-419
13	Chapter 10. Aquaculture production systems (10.1-10.3)	4		Have to read chapter 10 (10.1-10.3) in the handouts and learning material [4] page
14	Chapter 10. Aquaculture production systems (10.4)	4		Have to read the handouts in advance
15	Final exam	4		Review all lectures to the first exame

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ON BEHALF OF RECTOR
DEAN OF COLLEGE

BỘ GIÁO DỤC VÀ ĐÀO TẠO
TRƯỜNG ĐẠI HỌC CẦN THƠ

Vũ Ngọc Út

HEAD OF DEPARTMENT

Phạm Thanh Liêm