

SUBJECT OUTLINE DETAILS

1. Subject: Hatchery Operation and Management (Quản lý và vận hành trại giống) ...

- Code: AQ302
- Credits: 4
- Hours: 30 theory hours, 120 practice hours.

2. Management Unit:

- Department: Freshwater Aquaculture
- Faculty/School/Institute/Center/Department: Aquaculture and Fisheries

3. Prerequisites: Principles of Aquaculture

4. Subject objectives:

4.1. Knowledge:

After finishing this course the students will be able to:

- 4.1.1. Recall basic aquaculture knowledge.
- 4.1.2. Define different stages of oocyte and testis and also fish sex.
- 4.1.3. Identify stimulating fish spawning

4.2. Skill:

- 4.2.1. select good fish for spawning
- 4.2.2. stimulate broodstock spawning with different methods
- 4.2.3. practice experience from nursing fingerling
- 4.2.4. apply knowledge from visiting farms

4.3. Attitude:

- 4.3.1. develop attitude towards fish breeding
- 4.3.2. develop attitude towards larval nursing

5. Brief description of subject content:

- 5.1 Principles for seed production
- 5.2 Breeding fish species

6. Subject content structure:

6.1. Theory

	Content	Hours	Objectives
Chapter 1.	Principles for seed production	10	4.1, 4.2, 4.3
1.1	Introduction, Goals, Planning	1	
1.2	Identification of goals and planning.	1	
1.3	Physical facilities required.	1	
1.4	Physiology of reproduction.	1	
1.5	Brood stock development.	1	
1.6	Reproduction techniques.	1	
1.7	Egg and larval management.	1	
1.8	Embryo development.	1	
1.9	Nursery pond management	1	
1.10	Harvest and transportation of fish.	1	
Chapter 2.	Reproduction of commercial fishes in the Mekong Delta	20	4.1, 4.2, 4.3
2.1.	Reproduction of Common carp (<i>Cyprinus carpio</i>)	2	
2.2.	Reproduction of striped catfish (<i>Pangasianodon hypophthalmus</i>)	2	
2.3.	Reproduction of walking catfish (<i>Clarias macrocephalus</i>)	2	
2.4.	Reproduction of climbing perch (<i>Anabas testudineus</i>)	2	
2.5.	Reproduction of Snakeskin gourami (<i>Trichogaster pectoralis</i>)	2	
2.6.	Reproduction of snakehead fish (<i>Channa striata</i>)	2	
2.7.	Reproduction of silver barb (<i>Barboides gonionotus</i>)	2	
2.8.	Reproduction of Silver carp (<i>Hypophthalmichthys molitrix</i>)	2	
2.9.	Reproduction of fire-track eel (<i>Mastacembelus favus</i>)	2	
2.10.	Reproduction of mud loach (<i>Misgurnus anguillicaudatus</i>)	2	

6.2. Practice

	Content	Hours	Objectives
Unit 1.	Hatchery introduction	4	4.1, 4.2, 4.3
Unit 2.	Stimulating fish species (semi-floating eggs)	30	4.1, 4.2, 4.3

2.1. Silver carp *Hypophthalmichthys molitrix*

2.2. Silver barb *Puntius gonionotus*

Unit 3. Stimulating fish species (adhesive eggs) 30 4.1, 4.2, 4.3

3.1. Common carp *Cyprinus carpio*

3.2. Clarias catfish *Clarias macrocephalus*

Pangasius catfish *Pangasianodon hypophthalmus*

Unit 4. Stimulating fish species (floating eggs) 30 4.1, 4.2, 4.3

4.1. Climbing perch *Anabas testudineus*

4.2. Giant gourami *Trichogaster pectoralis*

Unit 5. Nursing larvae 30 4.1, 4.2, 4.3

5.1 Pond preparation

5.2 Plankton analysis

5.3 Larvae feeding

Unit 6. Field trip 120 4.1, 4.2, 4.3

6.1 Seed center

6.2 Feather back fish hatchery

6.3 Snakehead fish reproduction farm

6.4 Tilapia reproduction farm

6.5 Research Institute for Aquaculture

Southern freshwater seed center

7. Teaching method:

- Theory
- Practice

8. Duties of student:

Students have to do the following duties:

- Attend class
- Do fully practices

9. Assessment of student learning outcomes:

9.1. Assessment

No.	Point components	Rules and Requirement	Weights	Objectives
1	Exam I	Writing (30 min.)	20%	4.1
2	Exam II	Writing (30 min.)	20%	4.2
3	Final exam	Writing (60 min.)	50%	4.1, 4.2
4	Class notebook	Recording book	5%	4.1, 4.2, 4.3
5	Class project	Seminar	5%	4.1, 4.2, 4.3

9.2. Grading

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

10. Materials:

No.	Materials information	Code number
1	Andras Peteri, Shibabrata Nandi And Samarendra Nath Chowdhury, 1992. Improved Technology of Carp Broodfish Management. Ministry of Fisheries and Livestock, Department of Fisheries Government of Bangladesh, United Nations Development Programme, FAO. 15 pages	
2	Bach Thi Quynh Mai, 1999. Walking catfish culture techniques. Agricultural Publisher. 42 pages.	
3	Bakos J. and S. Gorda, 2001. Genetic Resources of Common Carp at the Fish Culture Research Institute, Szarvas, Hungary. FAO FISHERIES TECHNICAL PAPER 417. 82 pages	
4	Chung Lan, 1969. Biological basic for fish reproduction. Ha Noi Science and Technic Publisher.	
5	David O. Norris and Kristin H. Lopez, 2011. Hormones and reproduction of Vertebrates. Elsevier, 267 pages	
6	Donald B. McMillan, 2007. Fish Histology – Female Reproductive system. Springer. 587 pages	
7	Douglas Tave , 1995. Inbreeding and brood stock management FAO FISHERIES TECHNICAL PAPER 392. 150 pages.	
8	Douglas Tave , 1995. Selective breeding programmes or medium-sized fish farms. FAO FISHERIES TECHNICAL PAPER 352. 129 pages.	
9	Elsa Cabrita, Vanesa Robles, and Paz Herráez, 2009. Methods in Reproductive Aquaculture Marine and Freshwater Species. CRC Press	
10	Jingran, V.G and R.S.V Pulin, 1985. A hatchery manual for the common Chinese and Indian Major carp. Asian development bank International center for living aquatic resources managerment. P. 25-42	
11	Kirpichnikov, V.S. (1981) Genetic Bases of Fish Selection, Springer-Verlag, Berlin, 410.	
12	Nguyễn Tường Anh, 1999. Some aspects on fish endocrino. Agricultural Publisher.	

- 13 Patrick J. Babin, Joan Cerdà, Esther Lubzens, 2007. The Fish Oocyte From Basic Studies to Biotechnological Applications. Springer. 483 pages

11. Self-study Guide:

Week	Content	Theory (hours)	Practice (hours)	Students' duties
1	Principles for seed production	10	0	-Read before go to class: +Reference: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. + Outline of chapter 1
	Introduction, Goals, Planning			
	Identification of goals and planning.			
	Physical facilities required.			
	Physiology of reproduction.			
	Brood stock development.			
	Reproduction techniques.			
	Egg and larval management.			
	Embryo development.			
	Nursery pond management			
	Harvest and transportation of fish.			
2	Reproduction of commercial fishes in the Mekong Delta	20	0	-Read before go to class: +Reference: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. + Outline of chapter 2
	Reproduction of Common carp (<i>Cyprinus carpio</i>)			
	Reproduction of striped catfish (<i>Pangasianodon hypophthalmus</i>)			
	Reproduction of walking catfish (<i>Clarias macrocephalus</i>)			
	Reproduction of climbing perch (<i>Anabas testudineus</i>)			
	Reproduction of Snakeskin gourami (<i>Trichogaster pectoralis</i>)			
	Reproduction of			

	snakehead fish (<i>Channa striata</i>)			
	Reproduction of silver barb (<i>Barboides gonionotus</i>)			
	Reproduction of Silver carp (<i>Hypophthalmichthys molitrix</i>)			
	Reproduction of fire-track eel (<i>Mastacembelus favus</i>)			
	Reproduction of mud loach (<i>Misgurnus anguillicaudatus</i>)			

Can Tho, 31/7/2014

**ON BEHALF OF RECTOR
DEAN/ DIRECTOR**

HEAD OF DEPARTMENT