

1. INFORMATION OF COURSE AND LECTURER

- 1.1. Course name and code: **Artemia culture**
- 1.2. Course specification: 2 Cred. (Theory:20 ; Assigment: 0; Practice:20), 40 hours (T: 20; A: 0; P: 20)
- 1.3. Prerequisite courses: Feed and Nutrition in aquaculture
- 1.4. Responsible Department: Coastal Aquaculture
- 1.5. Information of lecturer:
 - Name: Nguyen Van Hoa (College of Aquaculture and Fisheries)
 - Email: nvhoa@ctu.edu.vn
 - Co-teaching lecturer:
 - Name : Gilbert Van Stappen (Ghent University, Belgium)
 - Email: gilbert.vanstappen@ugent.be

2. COURSE DESCRIPTION

The course provides knowledge on Artemia in term of classification, ecology, biology and its role in aquaculture. The main product of Artemia is extensively applied in aquaculture; therefore information on wild collecting of cysts in the world will be given; at the same time the farming of Artemia in solar saltworks will be introduced in more detail. For application in aquaculture, cyst quality and quality control will be discussed, beside techniques to enhance the nutritional value of biomass will be presented. In practice, the student will be trained in how to culture Artemia both in the lab and in the field.

3. COURSE EXPECTED LEARNING OUTCOMES

Students will study Artemia in theory and practice, through which they will learn about the natural habitat of Artemia, their biological characteristics, and how to apply in appropriate culture systems. They will also be trained in proper application of Artemia in aquaculture, both cysts and biomass

Theoretically:

- General introduction on Artemia biology, life cycle and taxonomy
- Role of Artemia in aquaculture; Artemia applications
- Artemia in its natural habitat: ecological aspects; harvesting in salt lakes
- Artemia indoors culture and farming in solar saltponds
- **Artemia culture trials in regional countries and African countries**
- Artemia cysts and biomass harversting and processing; quality maintenance and quality control

Practically:

- Artemia hatching
- Artemia culture in the laboratory (excursion to Vinhchau station)
- Artemia cyst quality control
- Decapsulation
- Enrichment
- Both field- and lab- works are avialble for training, theses and esspecially for internship students (Msc, PhD students)**

4. COURSE CONTENTS

Chapters	Hours (T/A/P)
<p>Chapter 1: INTRODUCTION</p> <p><i>This chapter will provide knowledge on systematics, ecology, and biology of Artemia</i></p> <p>1.1. Systematics 1.2. Ecology 1.3. Biology</p> <p><i>In order to understand well this chapter, students should read references of [1], [3].</i></p>	2/0/0
<p>Chapter 2: ARTEMIA IN ITS NATURAL HABITAT</p> <p><i>This chapter will provide knowledge on Artemia in its natural habitats, to understand the main natural resource of Artemia in the world.</i></p> <p>2.1. Great salt lake (Utah, United States) 2.2. Other salt lakes</p> <p><i>In order to understand well this chapter, students should read references of [1], [3].</i></p>	3/0/0
<p>Chapter 3: ARTEMIA CULTURE</p> <p>Artemia indoor culture will be practiced with the aim that students are able to set-up a culture test under laboratory conditions (volume ranging from few liters to a cubic meter, as requested). Larger scale culture in solar saltworks will be discussed in depth with the aim to produce either cysts or biomass for aquaculture.</p> <p>3.1. Artemia indoor culture 3.2. Artemia outdoor culture</p>	5/0/10
<p>Chapter 4: APPLICATION OF ARTEMIA IN AQUACULTURE</p> <p>Application of Artemia in aquaculture as well the use of Artemia as filter feeder for extractive aquaculture (i.e. integrated culture system).</p> <p>4.1. Application of Artemia cysts in aquaculture 4.2. Application of Artemia biomass in aquaculture 4.3. Artemia as filter feeder to apply in extractive aquaculture</p>	5/0/5

<p>Chapter 5: QUALITY CONTROL</p> <p>Better application of Artemia in aquaculture related to its biometric characteristics and other quality parameters; techniques of disinfection and decapsulation to eliminate pathogens and minimize the feed particle for most of shrimp/fish larvae, especially to early larval stages of mud-crab. Also, different enrichment techniques to be applied for Artemia biomass in order end up with nutrient-rich biomass prior to feeding to shrimp/fish larvae.</p> <p>5.1. Biometrics (size)</p> <p>5.2. Disinfection/decapsulation</p> <p>5.3. Enrichment</p>	5/0/5
--	-------

5. TEACHING METHODS AND ASSESSMENT

5.1. Teaching methods:

- Lectures in the class room and visual illustration methods occupy 1/2 of the credits of the subjects
- The remaining 1/2 of the credits is allocated to practical exercises in the laboratory (e.g. Artemia hatching, Artemia laboratory culture test, cyst quality control, enrichment) and to excursion to the field.

5.2. Assessment methods:

Students to be evaluated according to appropriate components such as:

No.	Components	Assignment	Weights	Objectives
1	Practicals	Report Attendance:100% practical hours	40%	
2	Excursion to Artemia farm	- Attendance: 100%	10%	
3	Final examination	- Written examination - Attendance: 80% lecture hours - Obligation	50%	

6. READING REFERENCES

- [1] Sorgeloos P., P. Lavens , P. Leger , W. Tackaert and D. Versichele, 1986. Manual for the culture and and use of brine shrimp *Artemia* in aquaculture.
- [2] Lavens. P. & Sorgeloos. P. 1996. Manual on the production and use of live food for aquaculture. 380p.
- [3] Abatzopoulos TJ, Beardmore JA, Clegg JS, Sorgeloos P. 2002. ARTEMIA: Basic and Applied Biology. Kluwer Academic Publishers. Netherlands.
- [4] Støttrup J.G. and McEvoy L.A. 2003. Live feeds in amrine aquaculture. Blackwell Science Ltd. 337 pp.
- [5]

Date: June 8,2015

Lecturer: Nguyen Van Hoa