

## 1. INFORMATION OF COURSE AND LECTURER

- 1.1. Course name and code: Water quality management in tropical aquaculture systems – AQ...
- 1.2. Course specification: 2 Cred. (Theory: 1; Assignment: 0; Practice: 1), 40 hours (T: 20; A: 0; P: 20)
- 1.3. Prerequisites courses: None
- 1.4. Responsible Department: Aquatic Pathology Department
- 1.5. Information of lecturer:  
Name: Truong Quoc Phu  
Email: tqphu@ctu.edu.vn  
Co-teaching lecturer:  
Name : Nguyen Phu Hoa  
Email: phuhoa0203@yahoo.com

## 2. COURSE DESCRIPTION

The course "Management of water quality in tropical aquaculture systems" provides learners the knowledge of the biological processes causing fluctuations in water quality factors, the effects of physical, chemical and biolog on aquatic life and the ways to manage water quality in aquaculture systems.

## 3. COURSE EXPECTED LEARNING OUTCOMES

After successful completion of this course learners are expected to be able to:

*Theoretically:*

- Know the important water quality parameters used in water quality management for aquaculture ponds.
- Describe the biological processes occurring in pond and the rule of fluctuation of water quality parameters.
- Have insight in the impacts of water quality parameters to aquatic life.
- Generallize the methods for managing water quality parameters in aquaculture ponds.

*Practically:*

- Carry out measurements of water quality parameters.
- Assess the status of water quality of aquaculture ponds based on measurements of water quality parameters.
- Analyze and interpret the causes of water quality problems.
- Offer the solutions to overcome the problems of water quality occurring in aquaculture ponds.
- Design water quality management plan for aquaculture farm.

## 4. COURSE CONTENTS

Chapters	Hours (T/A/P)
<b>Chapter 1: DINH DƯỠNG VÀ CÁC QUÁ TRÌNH SINH HỌC</b> <i>This chapter focuses on the biological processes that occur in the watershed and their impacts on water quality... This chapter has 20</i>	6/0/20

<p><i>hours in laboratory practice.</i></p> <ol style="list-style-type: none"> <li>1.1. Nutrient elements</li> <li>1.2. Photosynthesis and Respiration processes</li> <li>1.3. Nitrification process</li> <li>1.4. Denitrification process</li> <li>1.5. Anaerobic processes</li> </ol> <p><i>In order to understand well this chapter, learners should read references of [1], [2], [3], [4], [5].</i></p>	
<p><b>Chapter 2: Pond soil and liming</b></p> <p><i>This chapter will provide learners the knowledge and skills in kinds of lime, neutralizing value and efficiency rating of lime. Physical and chemical of pond soil, cation exchange capability and determination of lime requirement. This chapter has 1 hour presentation.</i></p> <ol style="list-style-type: none"> <li>2.1. Kind of lime</li> <li>2.2. Neutralizing value and efficiency rating of lime</li> <li>2.3. Pond soil and cation exchange capacity</li> <li>2.4. Determination of lime requirement</li> </ol> <p><i>In order to understand well this chapter, learners should read references of [1], [2].</i></p>	2/1/0
<p><b>Chapter 3: Fertilization</b></p> <p><i>This chapter will give learners the knowledge and skills composition of aquatic organisms in food web, properties of fertilizers and fertilization methods. This chapter has 1 hour presentation.</i></p> <ol style="list-style-type: none"> <li>2.1. Composition of aquatic in food web</li> <li>2.2. Inorganic fertilizers</li> <li>2.3. Organic fertilizers</li> <li>2.4. Fertilization methods</li> </ol> <p><i>In order to understand well this chapter, learners should read references of [1], [2].</i></p>	2/1/0
<p><b>Chapter 4: Water disinfection</b></p> <p><i>This chapter will provide learners knowledge about disinfection principle of physical and chemical agents, practical skills for water treatment. This chapter has 1 hour presentation.</i></p> <ol style="list-style-type: none"> <li>2.1. Disinfection by chlorine compounds</li> <li>2.2. Disinfection by iodine compounds</li> <li>2.3. Disinfection by other compounds</li> <li>2.4. Disinfection by UV radiation</li> </ol> <p><i>In order to understand well this chapter, learners should read references of [1], [2].</i></p>	2/1/0

<p><b>Chapter 5: Gas exchange</b></p> <p><i>This chapter focuses on the knowledge and skills on dynamics and management of dissolved gases and degasing. This chapter has 1 hour presentation.</i></p> <p>2.1. Dynamics and management of dissolved gases 2.2. Dynamics and management of dissolved oxygen 2.3. Degasing</p> <p><i>In order to understand well this chapter, learners should read references of [1], [2].</i></p>	2/1/0
<p><b>Chapter 6: Water treatment and reuse</b></p> <p><i>This chapter focuses on the principles and techniques of the water treatment models and reuse. This chapter has 1 hour presentation.</i></p> <p>2.1. Waste production in aquaculture ponds 2.2. Solid wastes removal 2.3. Biological fitration 2.4. Water treatment and reuse models</p> <p><i>In order to understand well this chapter, learners should read references of [1], [2].</i></p>	2/1/0

## 5. TEACHING METHODS AND ASSESSMENT

### 5.1. Teaching methods:

This course includes both theoretical (20 hours) and practical (20 hours) teaching. In class hours, learners have to perform group presentations.

### 5.2. Assessment methods:

Presentation	20%
Practice	20%
Final exam	60%

## 6. READING REFERENCES

- [1] Boyd, C.E., Tucker, C.S. (2014). Handbook for aquaculture water quality. *Handbook for Aquaculture Water Quality*. P.439.
- [2] Boyd, C.E. (1990). Water quality in pond for aquaculture. Birmingham Publishing Co., Birmingham, USA. 482 pp.
- [3] Boyd, C.E. and C.S. Tucker (1992). Water Quality and Pond Soil Analyses for Aquaculture. Alabama Agricultural Experiment Station, Auburn University, Alabama, 183 pp.
- [4] APHA, AWWA, WEF. 2001. Standard moethods for the examination of water and wastewater, 19<sup>th</sup> edition. American Public Health Association 1015 Fifteenth Street, NW Washington, DC 20005.
- [5] UNEP/WHO, 1996. Water Quality Monitoring - A practical guide to the design and implementation of freshwater quality studies and monitoring programmes. Published on behalf of United Nations Environment Programme and the World Health Organization. 348 pp.

*Date:*

**Lecturer**