

### 1. INFORMATION OF COURSE AND LECTURER

- 1.1. Course name and code: Aquatic Toxicology AQ616
- 1.2. Course specification: 2 Cred. (Theory: ; Assignment: ; Practice: ), 30 hours (T: 20; A/P: 20)
- 1.3. Prerequisites courses:
- 1.4. Responsible Department: Department of Environmental Sciences – College of Environment and Natural Resources
- 1.5. Information of lecturer:
  - Name: A/Prof. Nguyen Van Cong
  - Email: [nvcong@ctu.edu.vn](mailto:nvcong@ctu.edu.vn)
  - Co-teaching lecturer:

### 2. COURSE DESCRIPTION

Aquatic Toxicology mainly focuses on identifying effects of toxicants/toxins for aquatic organisms at different levels, including acute effects and sublethal effects. Achievements from aquatic toxicology have contributed for establishing limited levels of toxicants/toxins in aquatic environment for risk assessment and protection health of aquatic organisms as well as health of aquatic ecosystem.

### 3. COURSE EXPECTED LEARNING OUTCOMES

Students after attending the course, he/she should know:

*Theoretically:*

- Basic fundamentals of toxicology
- Uptake, bio-transformation, elimination and bio-accumulation of toxicants
- Mode of actions of common toxicants for organisms.
- Risk assessment of toxicants for aquatic organisms.

*Practically:*

- Design and carry out experiment to identify acute toxicity of toxicant for aquatic organisms

### 4. COURSE CONTENTS

Chapters	Hours (T/A/P)
<b>Chapter 1: General Introduction to Aquatic Toxicology</b> <ol style="list-style-type: none"> <li>1. History of aquatic toxicology and concepts in aquatic toxicology,</li> <li>2. Factors affect to toxicity of toxicants</li> <li>3. Contributions of aquatic toxicology</li> </ol> <p><i>A: LC50 estimation and comparison toxicity among toxicants</i></p>	2/5/0
<b>Chapter 2: Common Toxicants in water bodies</b> <ol style="list-style-type: none"> <li>1. Metals</li> <li>2. Pesticides</li> <li>3. Organic and Inorganics</li> </ol>	3/0/0

4. Others (Aflatoxins...)	
<b>Chapter 3: Uptake, biotransformation, elimination and accumulation of toxicants in aquatic organisms</b> 1. Uptake, 2. Biotransformation 3. Elimination 4. Accumulation	5/0/0
<b>Chapter 4: Mode of actions of common toxicants</b> 1. Metals 2. Pesticides 3. Organic and Inorganics  A: Seminar on effects of selected toxicants for aquatic organisms	5/5/0
<b>Chapter 5: Risk assessment</b> 1. Hazard identification 2. Exposure assessment 3. Effect assessment 4. Risk Characterization  <i>A: Risk assessment and management for several situations</i>	5/10/0

## 5. TEACHING METHODS AND ASSESSMENT

### 5.1. Teaching methods:

Theory lecturing and problem base learning

### 5.2. Assessment methods:

Multible choices questions and problem based solving

## 6. READING REFERENCES

Richardson M. (Ed.), 1995. Environmental Toxicity Assessment. Taylor & Francis.

Rand G.M. (Ed.), 1995. Fundamentals of Aquatic Toxicology, 2<sup>nd</sup> edition. Taylor & Francis. London and New York.

Connell D., Lamm P., Richardson R., and Wu R., 1999. Introduction to Ecotoxicology. Blackwell Science.

Masson C. F., 1996. *Biology of Freshwater Pollution*. Third edition. Longman

Peakall D. 1992. Animal Biomarkers as Pollution Indicators. Chapman & Hall. London.

Sprague J.B. 1971. Review paper: Measurement of pollution toxicity to fish-III, Sub-lethal effects and "safe" concentrations. *Water Research Pergamon Press*. Vol. 5, p. 245-266

*Date:*

**Lecturer**