

1. INFORMATION OF COURSE AND LECTURER

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

4. Others (Aflatoxins...)	
Chapter 3: Uptake, biotransformation, elimination and accumulation of toxicants in aquatic organisms 1. Uptake, 2. Biotransformation 3. Elimination 4. Accumulation	5/0/0
Chapter 4: Mode of actions of common toxicants 1. Metals 2. Pesticides 3. Organic and Inorganics A: Seminar on effects of selected toxicants for aquatic organisms	5/5/0
Chapter 5: Risk assessment 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, 2nd 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