

## BAGB305 Aquarium Sciences and Water Quality

ECTS Value: 5 ECTS

### Overall Objectives and Outcomes

This module will assist participants to master the skills of logical thinking and scientific questioning. Learners will be challenged by taking into consideration aquaculture as a hobby and a farming method, water as a resource and the symbiotic relationship created in aquaponics. This module requires that learners have a sound knowledge of fish biology and plant nutrition.

The unit is applicable to participants who wish to increase the knowledge of aquaculture and water. They will be required to enquire on the demands of the consumer and the various technologies utilised in water treatment. On completion of the module, participants will increase their interest in fish husbandry and water parameters. Learners will be stimulated to propose solutions for the impact of water quality due to the ever-growing aquaculture industry.

By the end of this module, the learner will be able to:

### Competences

- a. evaluate the construction requirements of aquaria as well as the various life support accessories used;
- b. critically evaluate various water parameters for aquacultural or horticultural production;
- c. develop a systematic feeding approach for a selection of aquaria;
- d. design a functional aquaponic system

### Knowledge

- a. know the tank requirements for various fish;
- b. appreciate the importance of different life support accessories on fish keeping;
- c. list important aquarium décor;
- d. be familiar with fish and invertebrates' habitat requirements with reference to habitat enrichment to assist reproduction;
- e. know the types of aquaria communities and themed tanks commonly deployed and in demand;
- f. identify water parameters ideal for a particular fish tank;
- g. identify water parameters ideal for a horticultural growing programme;
- h. identify water parameters ideal for an aquaponic growing programme;
- i. list the growth media used in aquaponics;
- j. appreciate the balance between stocking density, growing area and number of crops.

## Skills

- a. set-up, cycle and stock a range of different aquaria;
- b. use a range of instruments to monitor a water quality;
- c. use compatible aquatic organisms to form harmonious communities within a given marine aquarium system;
- d. work out the amendments/maintenance needed to keep the required water parameters for a particular production objective;
- e. design an aquaponic system to produce edible plants and fish;
- f. set-up and maintain an aquaponic system to produce edible plants and fish;
- g. decide the ideal set-up for a fish husbandry closed system;
- h. evaluate problems that arise due to fluctuations in water quality;
- i. decide on the best intervention to treat water;
- j. decide the ideal stocking density for commercial aquaponics;
- k. select the ideal crop and fish according to market, climatic conditions and type of feed;
- l. solve problems in relation to fishkeeping appliances;
- m. understand readings obtained through various water testing instruments;
- n. interpret and present environmental monitoring records for an aquarium;
- o. debate the best approach to reduce pollution in commercial aquaculture;
- p. prepare technical information for presentations to peers;
- q. source and reference information from appropriate websites, journals and texts;
- r. develop well-structured illustrated reports using an appropriate referencing system;
- s. take into consideration holistic approaches for aquacultural management that do not compromise environmental sustainability or production profit;
- t. use word processor software to produce documents suitable for academic presentation;
- u. keep records on PC or laptop;
- v. use data loggers and process results using the correct software.

## Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

## Assessment Methods

This module will be assessed through: Fieldwork and Assignment

## Suggested Readings

### Core Reading List

4. Alderton, D. (2008). Encyclopaedia of Aquarium and Pond fish. DK Publishers.
5. Konemann (1999). The complete aquarium guide: Fish, plants and accessories for your aquarium. UK: Konemann.
6. Pillay, T.V.R. and Kutty, M.N. (2005). Aquaculture principles and practices. (2<sup>nd</sup> Ed.) UK: Wiley-Blackwell.
7. Havlin, J.L. et. al (2004) Soil Fertility and Fertilizers: An Introduction to Nutrient Management, 7th Ed., Prentice Hall, United States
8. Western Plant Health Association (2010) Western Fertilizer Handbook, Waveland Press Inc., United States

### Supplementary Reading List

1. Bone, Q. and Moore, R.H. (2008). Biology of Fishes (3<sup>rd</sup> Ed.). UK: Routledge.
2. Roberts, H.E., (2009). Fundamentals of Ornamental Fish health. UK: Wiley-Blackwell