

**Florida Department of Education  
Curriculum Framework**

**Program Title:** Aquaculture Technology  
**Occupational Area:** Agriscience and Natural Resources

PSVC

CIP Number 0101030302  
Grade Level College Credit  
Standard Length College Credit Certificate – 26 credits  
Program SOC Code – 45-1011.06 – First-Line Supervisors/Managers of Aquacultural Workers

- I. MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as production managers, aquaculture lab technicians, field and farm assistants or First-Line Supervisors/Managers of Aquacultural Workers (45-1011.06).

The content includes, but is not limited to, instruction in ichthyology, fish breeding, fish nutrition, pond maintenance, diagnosis and treatment of diseases in fish, business management of a fish farm, and field experience necessary to operate an aquaculture operation.

- II. LABORATORY ACTIVITIES:** Aquaculture laboratory activities are an integral part of this curriculum. The activities include microscopic work, fish identification, disease diagnosis, fish necropsy, aquarium setup, water filtration, productivity measurements, water quality measurements, diet strategies, and field experience at aquaculture facilities.

**III. INTENDED OUTCOMES**

After successfully completing the program, the student will be able to:

- 01.0 Operate an aquaculture farm
- 02.0 Manage and supervise aquaculture employees
- 03.0 Manage fish
- 04.0 Manage a pond operation
- 05.0 Identify common aquaculture organisms
- 06.0 Diagnose and treat common aquaculture maladies
- 07.0 Operate aquaculture equipment
- 08.0 Manage aquaculture facilities
- 09.0 Breed fish
- 10.0 Maintain optimal nutrition for aquaculture organisms.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Program Title:** Aquaculture Technology  
**Postsecondary Number:** 0101030302

01.0 OPERATE AN AQUACULTURE FARM - The student will be able to:

- 01.01 Discuss a variety of aquaculture techniques
- 01.02 Compare different techniques for aquaculture
- 01.03 Describe fish rearing techniques
- 01.04 Operate a fish aquaculture operation
- 01.04 Discuss aquaculture operations.

02.0 MANAGE AND SUPERVISE AQUACULTURE EMPLOYEES - The student will be able to:

- 02.01 Explain the basic principles of management.
- 02.02 Evaluate techniques for aquaculture marketing.
- 02.03 Explain the regulations that govern aquaculture on the local, state and national levels.
- 02.04 Explain the principles of production economics to include costs, taxes, interest, depreciation, record keeping, cash flow and financial statements.
- 02.05 Estimate production in aquaculture.

03.0 MANAGE FISH - The student will be able to:

- 03.01 Identify the major families of fish
- 03.02 Describe the complexities of fish anatomy for the following systems:
  - Skeletal systems
  - Musculature
  - Nervous system
  - Vascular system
  - Respiratory system
  - Urogenital system
  - Digestive system
  - Reproductive system
- 3.03 Identify the major anatomical fish structures.
- 3.04 Describe the physiological characteristics of fish for the following:
  - Color
  - Bioluminescence
  - Sound production
  - Sensory systems
  - Osmoregulation

- 3.05 Classify fish.
- 3.06 Explain the basics of fish nutrition.
- 3.07 Describe the aquatic environment.
- 3.08 Discuss the basics of fish reproduction.
- 3.09 Discuss the basics of fish behavior.
- 3.10 Identify the muscles of a fish.
- 3.11 Measure the physical characteristics of fish.
- 3.12 Use a taxonomic key to identify fish.
- 3.13 Identify the major taxa of fish.

04.0 MANAGE A POND OPERATION - The student will be able to:

- 04.01 Explain the basic techniques for building aquaculture ponds.
- 04.02 Identify water quality measurements necessary for raising fish.
- 04.03 Explain the aquifer water quality in Florida.
- 04.04 Perform water chemistry quality measurements and explain their importance.
- 04.05 Produce aquatic plants in an aquaculture environment.
- 04.06 Identify filtration systems for aquaculture.
- 04.07 Manage water quality.
- 04.08 Explain water treatments.
- 04.09 Perform plankton analysis.
- 04.10 Describe the value of aeration systems.
- 04.11 Set up a closed system.
- 04.12 Set up cage systems.
- 04.13 Measure primary productivity.
- 04.14 Explain the importance of pond fertilization.
- 04.15 Explain the feeding techniques for large pond operations.
- 04.16 Measure density of organisms per acre.

05.0 IDENTIFY COMMON AQUACULTURE ORGANISMS - The student will be able to:

- 05.01 Evaluate techniques for aquaculturing marine fish.
- 05.02 Explain aquaculture techniques for pompano, redfish, snook, spotted sea trout, yellowtail, marine salmon, aquarium marine fish, and bait fish.
- 05.03 Evaluate techniques for aquaculturing invertebrates.
- 05.04 Explain techniques for the aquaculture of shrimp, lobster, blue crabs, oysters, clams, scallops, mussels, gastropods, and squid.
- 05.05 Evaluate techniques for culturing fresh and salt water plants.

06.0 DIAGNOSE AND TREAT COMMON AQUACULTURE MALADIES - The student will be able to:

- 06.01 Identify the common diseases that infect aquaculture organisms.
- 06.02 Describe the basic mechanisms for control of disease.
- 06.03 Identify bacterial diseases in fish.

- 06.04 Identify treatments for bacterial diseases in fish.
- 06.05 Identify mycotic diseases in fish.
- 06.06 Identify treatments for mycotic diseases in fish.
- 06.07 Identify viral diseases in fish.
- 06.08 Identify treatments for viral diseases in fish.
- 06.09 Identify protozoan infections in fish.
- 06.10 Identify treatments for protozoan infections in fish.
- 06.11 Identify the basic mechanisms of immunity in fish.
- 06.12 Identify nutritional diseases in fish.
- 06.13 Identify neoplastic diseases in fish.
- 06.14 Identify toxic environmental diseases in fish.
- 06.15 Culture common bacteria in the laboratory.
- 06.16 Identify common bacteria.
- 06.17 Identify common fungi in the laboratory.
- 06.18 Identify common aquatic parasites found in Florida waters.
- 06.19 Conduct nutritional experiments on aquaculture organisms.
- 06.20 Conduct necropsies on fish.

07.0 OPERATE AQUACULTURE EQUIPMENT - The student will be able to:

- 07.01 Set up standard aquaria.
- 07.02 Set up field aquaculture ponds.
- 07.03 Measure field parameters such as temperature, salinity, and hardness.
- 07.04 Set up aquaculture filtration systems.
- 07.05 Set up systems for culture of aquatic plants.
- 07.06 Measure productivity in aquaculture systems.

08.0 MANAGE AQUACULTURE FACILITIES - The student will be able to:

- 08.01 Understand the basic principles of management.
- 08.02 Evaluate techniques for aquaculture marketing.
- 08.03 Understand the regulations that govern aquaculture on the local, state, and national levels.
- 08.04 Understand the principles of production economics to include costs, taxes, interest, depreciation, record keeping, cash flow and financial statements.
- 08.05 Estimate production in aquaculture.
- 08.06 Understand and use management decision-making tools.
- 08.07 Use a computer for record keeping, production, and decision-making.

09.0 BREED FISH - The student will be able to:

- 09.01 Explain the reproductive anatomy of fish.
- 09.02 Explain production of sperm and eggs in fish.
- 09.03 Identify sex differences between fish.
- 09.04 Explain the sexual maturation in fish.
- 09.05 Explain the reproductive cycles in fish.

- 09.06 Set environmental factors for successful reproduction in fish.
  - 09.07 Explain how and when to use hormones to accelerate reproduction cycles.
  - 09.08 Explain the techniques for the care of fish eggs and the young fish.
- 10.0 MAINTAIN OPTIMAL NUTRITION FOR AQUACULTURE ORGANISMS -  
The student will be able to:
- 10.01 Explain the digestive anatomy of fish.
  - 10.02 Explain the basic concepts of fish nutrition.
  - 10.03 Explain the growth processes of fish.
  - 10.04 Identify the feeding habits of fish.
  - 10.05 Identify the nutritional requirements of fish.
  - 10.06 Identify the feeding habits of fish.
  - 10.07 Analyze fish food content.
  - 10.08 Explain fish metabolic rates.
  - 10.09 Identify fish food additives.
  - 10.10 Explain the established feeding practices for a variety of fish.