# Course Content and Outcome Guide for AQS 215

**Course Number:** AQS 215
**Course Title:** Biology of Captive Fishes
**Credit Hours:** 4
**Lecture Hours:** 30
**Lecture/Lab Hours:** 20
**Lab Hours:** 0

**Course Description**
Examines the diversity, anatomy, physiology, sensory biology, and behavior of freshwater and marine fishes and the constraints placed upon them in a controlled environment.

**Intended Outcomes for Course**

1. Identify basic external and internal anatomical features of fishes.
2. Identify fish species using a dichotomous key.
3. Recognize the immense diversity and variation among living fishes.
4. Describe the effects of key factors in the captive controlled environment on respiration, metabolism, immune response, food assimilation, growth, reproduction, and behavior.
5. Understand the influence of stress on fish physiology, health, and behavior.
6. Describe osmoregulatory processes of marine and freshwater fishes.
7. Develop and conduct a study of captive fish behavior.

**Course Activities and Design**
The course consists of lectures, laboratory exercises, student presentations, group discussion, reading, writing assignments, independent research, and field trips. Laboratory instruction will be based at the OCCC central campus Aquarium Science building.

**Outcome Assessment Strategies**

- Laboratory exercises with introduction to diversity, species identification, internal and external anatomy, specimen handling, specimen collection, and behavioral observations.
- Scheduled exams to evaluate knowledge of material presented in lecture, labs, and assigned reading.
- Discussion and synthesis of primary scientific literature relevant to the biology of captive fishes.
- Development, completion, and oral presentation of individual research projects on the behavior of captive fishes.

**Course Content (Themes, Concepts, Issues and Skills)**

**Themes**

- Morphological, physiological, and behavioral adaptations to the external environment.
- Influence of environmental factors on fish physiology and behavior.

- Sources and effects of stress on fish physiology and behavior.

**Concepts**

- Classification and identification of fishes including Class, Order, Family, Genus, and Species.
- Basic internal anatomy.
- Morphological, physiological, and behavioral adaptations to the external environment.
- Adaptations for respiration, osmoregulation, and movement.
- Integration and functional role of sensory, neural, and immune systems.
- Feeding and reproductive strategies of fishes.
- Influence of physical factors on fish physiology and behavior.
- Sources and effects of stress on fish physiology and behavior.

**Issues**

- Swimming modes.
- Buoyancy regulation in aquatic environments.
- Effect of temperature and salinity on oxygen availability in water.
- Metabolic rates and oxygen consumption.
- Trade-offs between reproductive strategy and reproductive effort.
- Dietary requirements of fishes.
- Immune function and responses.
- Aggression and competitive interactions in captive environments.

**Skills**

- Identify fish species using dichotomous keys.
- Distinguish selected families of fishes.
- Dissect and identify basic external and internal anatomical features of fishes.
- Describe the function of internal organs.
- Collect, monitor, and transport live fish from the field to a captive setting.
- Evaluate and summarize primary scientific literature.
- Develop and conduct a behavioral study of captive fishes using an ethogram.
- Effective communication and presentation of experimental results.
- Prepare a written summary of research results and conclusions.
- Recognize potential stress, behavioral, and health issues that may result from changes in physical parameters or stocking density.