

Course Content and Outcome Guide for AQS 270

Course Number: AQS 270

Course Title: Fish and Invertebrate Health Management

Credit Hours: 4

Lecture Hours: 30

Lecture/Lab Hours: 20

Lab Hours: 0

Course Description

Examines the common techniques and rationale for fish and invertebrate health management. Reviews the common infectious and noninfectious diseases and disease management strategies for captive fish and invertebrates.

Intended Outcomes for Course

1. Identify the common signs of disease in fish and invertebrates.
2. Describe the common infectious and noninfectious diseases associated with captive aquarium fish.
3. Demonstrate proper use and maintenance of laboratory instrumentation.
4. Demonstrate proper necropsy and sample collection techniques.
5. Formulate a health management and biosecurity plan based upon the results of diagnostic testing, water quality measurements and professional consultation.
6. Perform common treatment methodologies.

Course Activities and Design

The format of this course is a combination of lecture, demonstration, case-based activities, written assignments and laboratory experience to provide the necessary skills to develop disease prevention strategies, identify disease and develop treatment/management plans for aquarium systems and their inhabitants.

Outcome Assessment Strategies

- Laboratory activities and skill development sessions that utilize tools, materials and equipment for prevention and identification of common health problems associated with aquarium fish.
- Term project utilizing information and resources to develop a biosecurity plan for a selected animal holding facility.
- Case-based activities that utilize skills and knowledge to identify health and animal holding system problems and develop treatment and management strategies.
- Scheduled quizzes and examinations to evaluate knowledge of tools, materials, equipment, procedures and problem solving associated with common fish and invertebrate health problems encountered in the captive setting.
- Writing assignments that utilize the knowledge and skills of fish and invertebrate health management to communicate common diseases, management and husbandry practices to professional colleagues.

Course Content (Themes, Concepts, Issues and Skills)

Themes

- Goals and core practices associated with fish and invertebrate health management
- Applied aspects of fish anatomy, physiology and immunology as they relate stress management and disease prevention.
- Key principles and practices of biosecurity in an aquarium facility.
- Common approaches to disease identification and management.
- Common non-infectious diseases of fish and invertebrates and the predisposing factors for such diseases.
- Common infectious diseases of fish and invertebrates and the predisposing factors for such diseases.
- Treatment and management of common fish and invertebrate health problem.
- Emerging issues in fish and invertebrate welfare and health management.

Concepts

- Consideration of the main principles and goals of fish health management.
- Review of the common anatomical features of major fish and invertebrate groups.
- Review of key aspects of fish anatomy, physiology and immunology as they relate to the captive management of fish and invertebrates.
 - The role of epithelium and gills for respiration, osmoregulation and resistance to infectious agents.
 - The response of the epithelium and gills to damage and disease
 - The basics of the immune response in fish and common invertebrates maintained in aquaria.
 - The physiological stress response in fish and invertebrates.
 - Common husbandry factors associated with the physiological stress response.
- Common approaches to the identification of disease in fish and invertebrates.
 - The problem oriented approach to disease identification.
 - Common signs of disease and distress in fish and invertebrates.
 - The basic fish and invertebrate health work-up.
- Evaluation of a life support system in the face of an animal health problem.
- Noninfectious diseases of fish and invertebrates and the common factors predisposing animals to these diseases.
 - Nutritional diseases.
 - Neoplastic diseases.
 - Environmental diseases.
 - Traumatic injury.
- Infectious diseases of fish and invertebrates and the common factors predisposing animals to these diseases.
 - Common bacterial disease of aquarium species.
 - Common Viral diseases of aquarium species.

- Common mycotic diseases of aquarium species.
- Common parasites of aquarium species.
 - Protozoan diseases.
 - Metazoan diseases.
- Common considerations and techniques for treatment and disease management utilized for aquarium species.
 - Changes in husbandry practices.
 - Waterborne treatments.
 - Nutritional strategies.
 - Oral treatment strategies.
 - Injectable treatments.
 - Principles of vaccination.
- Emerging issues on fish and invertebrate welfare and health management.
 - Pain perception and assessment on fish and invertebrates.
 - Assessment of fish and invertebrate welfare.
 - How sensory stimuli affect fish and invertebrate health.
 - New approaches to training and enrichment of captive fish and invertebrates.

Issues

- Regulatory considerations for the treatment of fish and invertebrate species.
- Potential risks to animals associated with particular treatment strategies or combinations of therapeutics.
- Safe handling practices when working with common aquarium species.
- Working as a member of a health management team.
- Current thinking about fish and invertebrate welfare and its potential impact on aquarium husbandry techniques.

Skills

- Identify the common anatomical features of common fish and invertebrate groups
- Demonstrate proper necropsy techniques and sample collection for submission to a diagnostic laboratory.
- Demonstrate proper safe fish and invertebrate handling techniques.
- Demonstrate proper techniques for a physical examination, skin scrape, gill biopsy and blood collection for common aquarium fish and invertebrates.
- Calculate the proper dose for sedation and euthanasia of common fish and invertebrate species.
- Demonstrate the proper use of the microscope.
- Read and interpret common diagnostic laboratory findings and water quality results to identify the probable cause(s) of a fish or invertebrate health problem. Recognize when veterinary consultation is necessary.
- Troubleshoot life support problems associated with a fish health event through the interpretation of water quality measurements and the use of senses; sight, sound, smell.
- Develop a treatment and management protocol based upon facility/system history,

animal behavior, diagnostic findings, water quality results and veterinary consultation.

- Calculate system volumes and common drug dosages and durations for commonly used drugs and chemicals.
- Develop a biosecurity plan for an aquatic animal holding facility.
- Communicate and coordinate the development of a biosecurity plan with other members of the project team.
- Work as a member of a team to develop preventive health management strategies and a response to a disease outbreak.