



## **APBI 419 – Fish Health**

### **Course Description**

This course examines fish health and disease from the perspective of the fish, the pathogen, and the environments they share. Major bacterial, viral and parasitic diseases of cultured fish are explored and characteristics, epidemiology, prevention, control and management of causative agents are investigated. While the major diseases covered are particularly important to salmonid culture, the principles and practices are applicable to other species, both warm and coldwater.

### **Intended Student**

This course is intended for those seeking an introduction to fish health and disease as well as those already practicing in the field wishing further knowledge in the basic principles of fish health of the major diseases of cultured salmonid fish. Past students that have successfully completed this course have come from a wide variety of backgrounds (including Animal Science, Zoology, Botany, Biology, Bio-Resource Engineering, and the Department of Fisheries and Oceans Salmonid Enhancement Program) and regions (from as far away as Sweden and Hong Kong).

### **Prerequisites**

Students are required to have taken an animal physiology course (examples: APBI 311, APBI 312, BIOL 361, BIOL 363, BIOL 364, BIOL 454, BIOL 457) and it is recommended that students first take APBI 418. Students who wish to enrol in this course but who do not meet the requirements should contact the instructor for permission.

### **Course Objective**

The main objective of this course is to provide the tools and skills necessary to objectively evaluate the health of fish in culture situations. You will be able to describe the causative agents of the major bacterial, viral, and parasitic diseases of salmonid fishes and be able to confidently recognize and evaluate the major factors that contribute to disease outbreaks in culture. You will also be introduced to tools and techniques available to diagnose and respond to many common diseases.

### **Course Content**

Fish health is a vast and rapidly expanding discipline and this course will provide students with an introduction to the major topics and current issues involved over four modules.

### **Module 1:**

The anatomy and physiology of fish underlies their responses to pathogens and environmental perturbations. While some diseases/disorders are non-infectious, most are the result of a complex interaction between the host, a pathogen and the environment that they share. In this Module, you will become familiar with the anatomy and physiology of fish and the mechanisms by which fish defend themselves. You will be introduced to general diagnostic procedures and control methods and will evaluate their strengths and weaknesses. You will also be introduced to some diseases/disorders that are non-infectious in nature and gain an understanding of how the environment impacts fish and their systems to produce problems.

### **Module 2:**

Bacteria are everywhere. But if bacteria are all bad, why aren't all fish sick? Some bacteria are good, some are bad, and some are only bad under certain, specific conditions or circumstances. Fish have defences against bacteria, but they don't always function properly. This module will introduce you to the bacterial world and you will discover how these fascinating organisms are identified, what causes them to be pathogenic, how they are transmitted and how the diseases associated with them develop. You will discover how fish respond to bacterial infection and how the fishes systems and human control methods work. You will also be introduced to many of the bacterial pathogens that are problematic to finfish culture and learn about their aetiology and specific control methods.

### **Module 3:**

If you thought bacteria were tiny things that exist everywhere, what about viruses? They occur in the aquatic environment at tremendous concentrations! So why aren't there more problems associated with viruses? Well, maybe there are, we can't say for certain as our understanding of them is still in infancy stages. In this Module you will learn what a virus is and what a virus is not. You will meet some of the most important viral pathogens of salmonids and learn how they differ from other micro-organisms, how they replicate and how they transmit from one host to another. You will find out how fish respond to viral infections and what tools and techniques are available for diagnosis and control.

### **Module 4:**

Leeches and hookworms and sea lice, OH MY! There are all kinds of amazing little creatures that live in or on fish. They have developed fascinating lifestyles that allow them to exist in otherwise inhospitable environments and move from host to host. Some would say they are truly disgusting creatures, others would argue that they are magnificent in their diversity and complexity. Regardless, they are common. Not all parasites are terrible creatures wreaking death and destruction, but some are certainly more problematic than others. You will meet some of these organisms and discover how they are classified, how they associate with hosts, and how we try to control the worst of them.

### **Evaluation**

- There are four graded assignments. Each assignment is a question set which appears after the final lesson of the Module and has an individual course value of 10% (40% total)
- In addition, there are graded quizzes following each lesson. These are timed quizzes and count as 20% towards the final grade for the course
- A final examination is worth 40% of the final grade.

This course is web based, therefore email and internet access are required. Assignments are submitted via Connect.

### **Textbooks**

There will be no required text for this course. Supplementary readings are suggested with each lesson. These readings relate directly to the subject material of the lesson and are more detailed and specific than textbooks.