

# **AQUACULTURE - ADVANCED ISSUES**

Fall Semester 2008 Course Outline

**Department of Animal and Poultry Sciences**  
**Course No.: ANSC\*3050**

**Professor Richard Moccia**

## **COURSE OBJECTIVES:**

The goal of this course is to introduce senior undergraduate students to many of the fundamental principles, as well as advanced interdisciplinary issues, involved in the farming of aquatic organisms. The course will concentrate primarily on fish species due to their worldwide commercial importance. Lectures will cover a broad range of topics including fish physiology, behaviour, nutrition, genetics, water quality, health and disease, reproductive techniques, economic, political and legal issues, and various types of culture systems technologies. Students will analyze many of the contemporary challenges facing the aquaculture industry, through task exercises requiring interdisciplinary knowledge, lateral thinking, creative problem solving and bridging science and technology to enable issues management. Although the subject matter is focused on aquaculture, the pedagogical outcomes for students will include improved critical analysis and problem solving skills.

Although the course will be taught primarily by faculty from the Department of Animal and Poultry Science, selected guest lecturers may also be drawn from OAC, OVC, CBS and CPES, this being a true representation of the breadth of knowledge required for such a curriculum offering and underlining the wealth of expertise to be found in our faculty at Guelph. In addition, guest speakers from industry and the applied research sector, will balance the presentations with their hands-on expertise. This diverse mix will give the student a broad perspective on the issues, principles, and technologies which are relevant to the commercial production of captive fish populations.

Finally, the course is designed to challenge students to develop independent and critical thinking skills through lateral thinking exercises, interdisciplinary problem solving and in-class discussions around case studies and issues management tasks.

**Class participation is expected and is essential to success in this course.**

In This Course it is Hoped that Students will Attain:

1. **Literacy** by reading, discussing and analyzing assigned texts and case studies and completion of a research topic for presentation.
2. **Numeracy** through presentation of statistical trends and developments in aquaculture and the use of mathematical models to represent complex ecological systems.
3. **Sense of Historical Development** through presentations on global aquacultural developments.

4. **Moral Maturity** will be fostered through analysis of case studies affecting modern aquacultural practises, e.g. transgenics and fish welfare.
5. **Understanding of Forms of Enquiry** will be developed via case-studies presenting complex socio-economic topics in aquaculture.
6. **Depth and Breadth of Understanding** through discussion and analysis of assigned texts and case studies.
7. **Independence of Thought** by identifying, researching and organizing various sources of information for completion of case studies and presentation topic.
8. **Love of Learning** will be encouraged through the involvement of a diversity of guest speakers and an informal field trip. Furthermore, the opportunity for personal involvement in learning will be provided in the student's selection of a research presentation topic.

### **MATERIAL TO BE COVERED:**

Lectures will cover a broad range of topics including basic fish physiology and behaviour, nutrition, genetics and breeding, water quality, health and disease, reproductive techniques, economics and legal aspects, various types of rearing systems technology etc., as well as analyze many of the contemporary challenges which face the industry. The focus will be on finfish aquaculture as it relates to Canada's agrifood industry, but additional materials will be covered from marine and tropical aquaculture situations.

### **METHODS OF PRESENTATION**

Instructors will present discipline-specific material and case studies developed from contemporary problems which face the industry. In addition, guest speakers from industry and the applied research or production sector will balance the presentations with their hands-on expertise. This diverse mix will give the student a broad perspective on the issues, principles, and technologies which are relevant to the commercial production of captive fish populations.

One field trip will be scheduled for students to visit the Alma Aquaculture Research Station. This facility is a large, technically sophisticated research and development center, which allows students to view first-hand, many of the types of fish species, equipment and operational procedures discussed in the course.

A series of discipline studies discussed in-class, will also challenge students to critically analyze several contemporary issues facing the development of aquaculture in an ecologically sustainable manner.

Weekly, online quizzes will challenge the students to incorporate material from across several disciplines, in order to solve problems developed from lectures and various case studies presented.

## **COURSE CO-ORDINATOR AND PRIMARY INSTRUCTOR:**

Professor Richard D. Moccia  
Room 135, ANNU, ext. 56216  
or  
Room 136 2NW, 519-826-3800  
1 Stone Road West Government Building

**Email:** rmoccia@uoguelph.ca  
**Website:** <http://www.aps.uoguelph.ca/~rmoccia/>

**TEACHING ASSISTANT:** None

**LECTURE SLOT AND TIMES:** Friday, September 5 – Thursday, November 27, 2008.

### **Mackinnon Building, Room 306**

Monday 2:30 - 3:20 pm.  
Wednesday 2:30 – 3:20 pm.  
Friday 2:30 - 3:20 pm.

**FINAL EXAM:** No final exam in this course.

**FIELD TRIP:** Alma Aquaculture Research Station, TBA, possibly Sunday, October 11, 2008.

**LABS:** No formal lab sessions, but possible informal discussion groups.

**OFFICE CONSULTATION HOURS:** No specific times. Individual faculty will be available on an as-need basis during the week of their scheduled lectures. The course co-ordinator will normally be available Thursday afternoon from 3-4 pm. throughout the semester. Email consultation is acceptable. Please check your email weekly, for updates.

### **FIELD TRIP:**

One field trip will be scheduled for students to visit the Alma Aquaculture Research Station, tentatively scheduled for Sunday, October 11, departing at 0900 hrs. This facility is a large, technically sophisticated research and development center, which permits students to view first-hand, many of the types of fish species, equipment and operational procedures discussed in the course. The Alma Aquaculture Research Station is owned by the province of Ontario, is financially supported by the Ontario Ministry of Agriculture, Food and Rural Affairs, and is managed and operated by the University of Guelph, Aquaculture Centre. There is no charge for this field trip.

### **METHOD OF EVALUATION:**

Online Task Assignments	0% (2 quizzes @ 0% each, but must be completed)
Online Task Assignments	80% (8 quizzes @ 10% each)
Team Presentations	20% (1 team presentation @ 20% each)
<b>Total = 100%</b>	

**Online Quizzes:** Ten, short, online problem solving quizzes will be posted on the Blackboard Learning System-Courselink website throughout the semester. They will represent a task assignment related to a prior lecture series in the course, and will require additional reading, discussion and short, essay type responses, typically 2-3 pages in length. After discussion of the task assignment in class, a 'time window' will be set for each task completion. This course requires completion of all 10 quizzes, although 2 are practice quizzes and will not receive a grade.

**Examinations:** There will be no formal mid term or final examinations in this course.

**Team Presentations and Task Assignments:**

'**Solution Teams**' will be made up of one or more students each, depending on the class size. During the final week of the semester, all teams will be required to present a formal seminar to the class. These teams will be expected to complete a problem-based assignment of their own choosing, although the nature of the assignment MUST BE approved by the course co-ordinator no later than the end of week 5 (October 10). After deciding on a 'Real' or 'Hypothetical' problem, the team will organize itself around the task of solving the problem and presenting -and defending- it in front of the entire class. Research literature will need to be reviewed and discussed by the team, and brainstorming sessions should attempt to develop unique solutions to the problem, and identify the various pros and cons which relate to the approach. Brief (max. 20 minute) presentations will be made by the team, and the entire class will debate the merits of the 'solution' or other scenario presented. Teams are encouraged to be innovative in their approaches to problem-solving, and not to be afraid of taking risks with their ideas. NO IDEA is, 'TOO FAR OUT', as long as the team can present a convincing case for the solution. A written report, including references and a copy of the power point or other presentation materials will be required for hand-in. The length and detail required for these reports will vary depending on the particular assignment, and this will be reviewed in consultation with the course co-ordinator prior to undertaking the assignment.

**Plagiarism:** You are required to be fully aware of university policy on academic misconduct and plagiarism, and task assignments and other material completed for the course may be assessed for plagiarism using third-party software packages available.

See also: [http://www.uoguelph.ca/undergrad\\_calendar/c01/index.shtml](http://www.uoguelph.ca/undergrad_calendar/c01/index.shtml)

**EMAIL LISTSERV MATERIAL**

Throughout the semester, various bits of information and short news-type articles will be delivered to you via the 'Aquanews' email distribution listserv, as well as other material posted only to the class list. You will be required to sign up for this during the first week of classes. This material should be considered REQUIRED READING, as it may relate to the exam or short task questions.

\* To sign up for the Aquanews Listserv, send an email to [rmoccia@uoguelph.ca](mailto:rmoccia@uoguelph.ca) and put 'Add Aquanews' in the subject line of the email.

**READING MATERIAL:**

Because of the broad, interdisciplinary nature of this course, there is no single textbook available or required. A list of reading material will be provided by each individual instructor as appropriate for their particular discipline area. A bibliography factsheet will be provided to you during the first week of lectures.

**INTERNET SITES:**

There are an abundance of internet sites available which deal directly with aquaculture and related areas. The Aquaculture Centre at the University of Guelph has an informative website at the following URL: **<http://www.aps.uoguelph.ca/~aquacentre/>**

Feel free to check it out to see the many activities that the University of Guelph is involved with concerning aquaculture. Within our website, you will also find a 'Directory of Aquaculture Links' at the following URL: **<http://www.aps.uoguelph.ca/~aquacentre/ABM/ABM.htm>**

One scheduled lecture may be left open so that you can take class time to review our website as well as the many useful links categorized in the **Directory**. Although this will not be a supervised internet session, it is expected that you will dedicate the 50 minute lecture slot to this exercise. It will help you considerably with your task presentation topic selection, and will give you a jump-start on many sources of information available to assist your comprehension of lecture material.

***Cell Phones, Pagers, Blackberries, Blueberries, Cordless Drills, Blow Dryers etc.:*** If you want to stay in class, TURN THEM OFF, otherwise take the course by correspondence (currently not available this way !)