

Faculty of Science Course Syllabus
Department of Biology
MARI 3602.03
Introduction to Aquaculture
Fall 2017

Instructor(s): Christophe Herbinger *e-mail* Christophe.Herbinger@dal.ca *Office location* LSC 4056

Lectures: T R 11:35 – 12:55, in room P4258 (Psychology)

Course Description

This course offers a lecture-based introductory overview of aquaculture; the culturing and rearing of aquatic plants and animals. Lectures will deal with the following topics: general overview of aquaculture; physical and chemical properties of the aquatic environment; site selection; aquatic engineering; finfish culture; bivalve culture; crustacean culture; seaweed culture; health and pathology; growth and nutrition; genetics and reproduction; legal, economic, social and environmental considerations. These topics will be covered with both a Maritimes and a global perspective.

This course is designed to familiarize students with the multi-disciplinary nature of aquaculture as a field. The introduction will describe the state of aquaculture production in the world. The main body of the course is divided in three sections covering the aquatic milieu, species specific culture techniques, and general biological principles. The amount of interplay between various physical, biological and species-specific aspects will be shown in each topic. We will conclude with a brief overview of the legal, economic and social considerations and we will look at some of the controversies surrounding aquaculture environmental sustainability. This is an introductory class, and most topics will not be covered in fine details. However I expect student to get a clear appreciation of the underlying principles of aquaculture and how these come into play in chosen examples of aquaculture practices.

Course Prerequisites

BIOL 2003.03

Course Objectives/Learning Outcomes

- Describe the historical and current state of aquaculture in the world
- Describe the basic physical-chemical parameters of water that are relevant to aquaculture
- Explain current culture systems and associated basic engineering aspects
- Characterize the biology and culture of 8 major groups of cultured aquatic organisms
- Explain basic reproductive physiology and the application of genetic tools to aquaculture
- Identify the important macro and micro nutrients relevant to fish nutrition and feed formulation
- States the main factors related to aquatic health and disease and their interplay
- Describe the main economic, legal and social contexts associated with aquaculture
- Read and summarize several papers and discuss various point of views related to aquaculture environmental impacts and sustainability (Group discussion)
- Extract information from relevant book chapters for a teaching presentation (Class presentation)

Course Materials

Textbook:

Aquaculture. Farming Aquatic Animals and Plants. 2nd edition 2012. J. Lucas and P. Southgate (Editors), 629 pp. OR Aquaculture. Farming Aquatic Animals and Plants. 2003, J. Lucas and P. Southgate (Editors), 502 pp.

The book (2nd edition) is available at Dalhousie Bookstore. Both editions of the textbook are also on reserve at the Killam library.

In addition, copies of a few articles are/will be on short-term (2 hours) reserve at the Killam library. These articles complement the textbook on material that is not covered in the textbook.

Class notes

Class notes are posted on Brightspace. Announcements and additional material will be posted regularly and students should check the site frequently.

Other useful reading material.

Encyclopedia of Aquaculture. (2000). R. Stickney (Editor)

This book is in the Killam library **Reference Section**. SH 20.3 E53 This is an excellent and relatively up-to-date source of information.

The following books at the Killam library are also useful.

Principles of Aquaculture. R Stickney	SH 135 S74 1994
Introduction to aquaculture. M. Landau	SH 135 L36 1992
Ecological Aquaculture. The evolution of the blue revolution B. Costa-Pierce	SH 135 E35 2002
Cold-water aquaculture in Atlantic Canada A. Boghen	SH 37 C64 1995

Course Assessment

Component	Weight (% of final grade)	
Daily Quizzes	34	
Mid Term	10	(Oct 24, tentative)
Student Presentation	15	
Paper summaries & Class Discussion	14	(Nov 28 & 30)
Final Exam	26	
Participation in classes	1	
Total	/100	

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Course policies

Daily Quizzes: At the beginning of each lecture (except the student presentation lectures), a written quiz (approx. 10 minutes) will be applied to test the material taught during the previous lecture. Students are required to bring and use a hand-written “cheat-sheet” for each Daily Quiz, which is handed in along with quiz answers. Cheat-sheets not meeting specifications (see below) will result in a zero grade in the corresponding quiz.

Cheat-sheet specifications:

- Cheat-sheets are personal. **Copying somebody else’s cheat-sheet is a serious plagiarism offence**, which requires reporting all involved parties to the Academic Integrity Office
- Cheat-sheets **MUST** be hand-written on paper. Digitization, electronic manipulation, photocopying, photographing and/or printing of cheat-sheets is not allowed
- Size: each cheat-sheet is limited to one side of a letter-sized sheet of paper
- Content: Anything you want, but **must** demonstrate effort to synthesize lecture content

NOTE: On the back of your cheat-sheet, write your name, B00 number, date and answers for the Daily Quiz.

There are NO make-up quizzes or exemptions unless you miss several quizzes due to exceptional circumstances that can be verified via appropriate documentation.

Materials in weeks 5, 6 & 7 (Algae/Finfish/Bivalve culture) will be covered through student presentations. These group presentations will be based mostly on the textbook and other material that will be provided. These presentations will be posted on Brightspace. You will need to provide this material to the instructor the day before your presentation so that fellow students can print it if they wish.

To prepare for the Class Discussions on Sustainability and Controversies (week 13), students will have to read and summarize in writing several discussions/opinion papers.

Course Content

Week	<i>Day</i>	<i>Contents</i>	<i>Tests</i>
1	Tue, Thu	Course presentation	
		Introduction: history, production and trends	
2	Tue, Thu	Introduction: history, production and trends	
		Physico-chemistry of water, sources of water	
3	Tue, Thu	Physico-chemistry of water, sources of water	
		Culture systems, site selection	
4	Tue, Thu	Culture systems, site selection	
		Aquaculture engineering	
5	Tue, Thu	Aquaculture engineering	
		Algae/Finfish/Bivalve culture	<i>Student presentations</i>
6	Tue, Thu	Algae/Finfish/Bivalve culture	<i>Student presentations</i>
		Algae/Finfish/Bivalve culture	<i>Student presentations</i>
7	Tue, Thu	Algae/Finfish/Bivalve culture	<i>Student presentations</i>
		Genetics and Reproduction I	
8	Tue, Thu	Genetics and Reproduction II	<i>Test (week 5-7)</i>
		Genetics and Reproduction III	
9	Tue, Thu	Nutrition and growth I	
		Nutrition and growth II	
10		Study break	
11	Tue, Thu	Disease I	
		Disease II	
12	Tue, Thu	Legal, economic and social context	
		Legal, economic and social context	
13	Tue, Thu	Sustainability and Controversies	<i>Class discussion</i>
		Sustainability and Controversies	<i>Class discussion</i>
	Dec 7-17	To be set up by the registrar	<i>Final test</i>