

Syllabus

AQUACULTURE PRODUCTION

ANSC/OCN 450

FALL, 2012

Wednesday 4:30 pm, Agriculture Sciences Bldg 220

Required Texts

This text material is required reading and material directly from it appears in the lecture notes and exams.

Textbook

No formal textbook. Use readings below and Power Point notes.

Papers posted on the class Lulima web site.

1. **Barck-Morre, L. (1986)** Input of organic materials into aquaculture systems: emphasis on feeding semi-intensive systems. *Aquacultural Engineering* 5 123-133.
2. **Barck-Moore, L. (1985)** The role of feeds and feeding in aquatic animal production. *Geo Journal* 10.3 245-251.
3. **Colt, J. (1991)** Aquaculture production systems. *Journal of Animal Sciences*. 69:4183-4192.
4. **Shell, E. W. (1991)** Husbandry of animals on land and in water: similarities and differences. *Journal of Animal Sciences* 69: 4176-4182.
5. **Shang, Y. C. (1981)** "The Profit Equation" (sic). Chapter 3: Factors Affecting the Economics of Aquaculture: A Review at the Farm Level. *Aquaculture Economics*, Westview Press Boulder, Colorado.
6. **Hepher, B. (1978)** Ecological Aspects of Warm Water Fishpond Management. Ch 18. pp 447-468 in S. D. Gerking, ed. *Ecology of Freshwater Fish Production*. Elsevier Publishing Co., UK.
7. **Pew Report (2001)** *Marine Aquaculture in the United States. Environmental Impacts and Policy Options*. Prepared for the Pew Oceans Commission. 2101 Wilson Boulevard, Suite 550, Arlington, Virginia 22201.
8. **Naylor et al. (2000)** Effect of aquaculture on world fish supplies. *Nature* 405 (June 29, 2000) 1017-1024.
9. **Harvey and Hoar (1979)** *The Theory and Practice of Induced Breeding in Fish*. 48 pp. International Research Center (IDRC) Ottawa, Canada.
10. **Szyper et al. (2001)** Maturation, Hatchery, and Nursery Techniques for Chinese Catfish, *Clarias fuscus*, in Hawaii. *Aquaculture Extension Bulletin*, Univ. Hawaii Sea Grant Program. UNHI-SEAGRANT-AB-01-01.
11. **Talbot (1993)** Some Aspects of the biology of feeding and growth in fish. *Proceedings of the Nutrition Society* 52: 403-416.
12. **Hites et al. (2004)** Global assessment of organic contaminants in farmed salmon. *Science* 303 (Jan. 9, 2004): 226-229. The pdf file also contains a response to the health risks: **Mozaffarin and Rimm (2006)** Fish intake, contaminants, and human Health. *Journal of the American Medical Association (JAMA)* 296 (Oct. 18, 2006) 1885-1887.
13. **Hardy reports**. This is a pdf file containing a compilation of elegant reports and articles by Dr. Ron Hardy U. Idaho, addressing/refuting the major environmental issues in aquaculture: contamination, wild vs. farmed, omega oils, fish meal.
14. **Forthcoming**. Text material for lectures 10 and 16 possible.

Reference Material. There are other items (video clips, papers, text material etc.) posted on the Lulima site that can be used as reference material for the class lecture material. This material is not "required" formally but will help interpret the lecture material and text material and you are encouraged to look at it.

Course Schedule

<u>Lecture No.</u>	<u>Date</u>	<u>Topic</u>	<u>Texts</u>
<u>AUGUST</u>			
1	Aug. 22	Get Acquainted etc. <u>Introduction to Aquaculture Systems I: Intensification</u>	Colt (1991) (Barck-Moore 1985,'86)
2	Aug. 29	<u>Introduction to Aquaculture Systems II: Water flow, Confinements</u>	Colt (1991) (Barck-Moore 1985,'86)
<u>SEPTEMBER</u>			
3	Sept. 5	<u>Aquaculture System Characteristics in Comparison with Agriculture I: Medium, Industry Sectors, Domestication, Competition</u>	Shell (1991)
4	Sept. 12	<u>Aquaculture System Characteristics in Comparison with Agriculture II: Polyculture, Genetics, Fecundity, Growth Patterns, Energy Levels</u>	"
Exam -1: Sept. 17-18 Covers <u>Introduction; Agriculture-Aquaculture</u> . Taken on Laulima from 6:00 am- 12:00 pm (midnight), no time limit			
5	Sept. 19	<u>The Profit Equation: $P = B \times P - C$ (Profit=Biological variables x Price – Costs) I : Biological Variables, Mortality, Stocking Density, Growth Dynamics</u> <u>Second Hour:</u> Exam-1 "post mortem" discussion	Shang (1981)
6	Sept 26	<u>The Profit Equation II: Price, Cost variables, Marketing, Economics</u>	"
<u>OCTOBER</u>			
7	Oct. 3	<u>Nutrition, Metabolism, Growth, Energy, Production</u>	Talbot (1993)
8	Oct. 10	<u>Critical Standing Crop, Carrying Capacity, Yield</u>	Hepher (1978)
9	Oct. 17	<u>Controlled Reproduction and Spawning: fish and crustaceans</u>	Harvey & Hoar (1979) Szyper et al. (2001)
Exam-2: Oct. 22-23 Covers the "Profit Equation": $P = B \times P - C$, Metabolism, Growth, Energy, Production, Critical Standing Crop, Carrying Capacity, and Reproduction. Taken on Laulima from 6:00 m-12:00 pm, no time limit			
10	Oct. 24	<u>Water: What is It and What Happens in It : Composition, Quality, Osmoregulation, Respiration</u> <u>Second Hour:</u> Exam-2 post mortem	(forthcoming?)
11	Oct 31	HAPPY HOLOWEEN <u>Environmental Issues, Biotechnology, Future</u>	Pew Report (2001) Naylor et al. (2000) Hites et al. (2004) Hardy reports

get permission, using the agreement form as the end of this document, to use a laptop in class (see policy on electronic devices below)

2. Bring a Downloaded Lecture Note Hard Copy to Class and Annotate It

You can download the Power Point class notes before each lecture and bringing a hard copy of the notes to class to annotate them as the lecture is given. The lecture notes will be posted before each lecture usually no later than 4:30 pm on the previous day (Tuesday) before lecture. I will try to post the lecture notes earlier than this.

No hard copy of the notes will be handed out in class!

The class notes will be in a compressed Power Point file and will be labeled as the “Handout” version of the lecture notes. This is because the Power Point “Handout” version of the lecture notes will contain numerous blank places and areas that you are to copy in from “Presentation” version of the Power Point slides I will be showing in the lecture. Before each exam I will post the Presentation version so that you can check your annotated Handout version with it.

It is strongly advised that you bring in hard copy Power Notes with only two slide images per page. For complicated tables etc. you should print this material as a “slide” image so that it occupies the entire page and you can read it in the lecture. To print out these versions open the Power Point file and click on “Print” print menu item where you will be give a choice of printing “Slides” or “Handouts”. Click on “Handouts” and you will be given a choice of “two per page”, “four per page”, etc. Click on the choice “two per page”. To print out a slide on the entire page click on “slides” and type in the slide number you wanted printed out on the entire page. If you print out the slide images **with four or more images per page you will not be able to easily read the text on the hard copy during lecture**. The words will be too small. You can print on both sides of the page (double sided pages) to save paper.

I will post compressed Power Point files for you to download to save disk space and reduce downloading time but be prepared to wait a little until larger Power Point files, containing many pictures, take time to download to your computer.

Some students in last year’s class were able to print out snazzy two per page color images and took great notes and got an A+ in the class.

Class Length, Food, Drinks

The class is given once per week in the late afternoon which allows people working during the day to attend. We get high school teachers and others who take the course after their work day. It is long class! Be prepared for this. Hydrate and eat before you come or during the breaks. There are no vending machines in the Agriculture Sciences building. The closest vending machines are in the Biomed building across the street. These can be accessed quickly during the break. We will take a 10 minute break in the middle of class, which lasts from 4:30 pm- ~6:20 pm.

Class Start Time and Front Door Entry Code

We will start class at 4:30 pm sharp! People straggling in are disruptive to the class. If you will have, or are having, a difficult time making the class on time advise me. Sometimes, by class consensus, we have moved the class start time back to accommodate a legitimate inability to make it on time.

The Agriculture Science building's front door automatically locks ~4:30 pm. To accommodate the aforementioned and legitimate, *ad hoc*, tardiness a past code for the door will be issued in class. This will be good for a short time after 4: 30 pm.

Electronic devices, Texting, Cell Phones, IPADS

ABSOLUTELY NO CELL PHONES or IPADS ALLOWED IN CLASS. You must keep these devices off and out of site.

No exceptions!!!

ZERO TOLERANCE POLICY. CAUGHT ONCE YOU ARE OUT OF CLASS, NO QUESTIONS , NO EXCUSES, NO RECOURSE...you're done

Only laptop computers, to take notes from the Power Point slides, are allowed with a signed agreement. The agreement form is found at the end of this document. Bring it to the first class to be allowed to use your laptop.

Text Material

The text material for the course is listed above in the course schedule and posted on the Laumila site. This consists of text papers and other information related to the lecture topics. The text material is posted under “TEXT MATERIAL” on the main menu of the class Laulima web site. You are responsible for reading and mastering all the text material.

Questions relating to the text material can be on the exams even though this material is not *explicitly* covered in class. You can read the posted text material online and/or download a hard copy of it.

HINT: if you have a hard copy of the text material at your disposal during the exams it is easier to answer a question relating to the text material rather than have the latter displayed in a window separate from the window displaying the exam. However, you can do the latter by opening a window containing the exam and then going back to the site and opening a window containing the text and other material that you can display side by side with the exam question relating to it. I prefer to have a hard copy by my side.

Grading Guidelines

Class Attendance, Professional Attitude and Participation (300 points, 50 % of course grade)

Come to all the classes and have a professional approach; email a notice if you can't make it. Ask good questions, be alert, challenge points in a professional way. I like to interact with students and discuss topics, especially challenges to points I make and challenges to the intra-term exam questions during the post mortem sessions discussed below. I regard the personal contact aspect of the lectures as very important. The “medium is the message” otherwise we could conduct this class over the internet and not have “live” lectures. Some people don't participate in a group setting like class. ***E-mail contact counts. Email me!***

Also, you can increase the submissions postings on the course web site *as described in the next section*. The point here is to show that you have thought about the substance of the material and analyzed/critiqued it.

Participation by questions, comments. notices as Web site postings

During the semester each student should post substantive submissions to the class Laulima web site.. A main purpose of this section is to demonstrate your analytical skills, critical thinking, writing skills, professional attitude, and to showcase yourself. You can read other's submissions and comment, analyze, and critique them. Please make only *substitutive* comments that relate to the class material presented in the lectures and the text and other resource material posted on the class web site.

Examples are posted on the class Web site as “journal” submissions from previous years, where the format was slightly different than described here.

Your postings should refer to something you read as follows.

1. Text material, resource material, or material presented in the lecture. This is a good opportunity to thoroughly read the text material and correlate it to the lecture material and ask a question or answer another question and make comments about other's submissions. This kills two birds with one stone. It allows you to get command of the text material etc. and to demonstrate your skills and make me aware of you.
2. News media especially the print media (newspapers and magazines). Brose newspapers and magazines each week searching for the major news items. Brose all the Hawaii dailies and Hawaii magazines as well as major national news print like the New York Times, L.A. Times etc. I am interested in up-to-date items that reflect issues relating to aquaculture in the news as it relates to topics discussed in class. Do not submit general newsy stuff about aquatic animals such as a story about porpoises unless it directly relates to something related to a class topic. For example, you may find an article about the world's aquaculture production and how it is rising, declining, staying the same etc. In your analysis discuss what this means. In each of the submissions submit:
 - a reference to a url web site etc. or another reference (copy of the article attached to submission would be nice)
 - a summary paragraph of the news item
 - a brief analysis paragraph of the item from your perspective and how the news item relates to the class material covered since the previous submission or from the beginning of class

Evaluation criteria of your blog submissions will be:

Relevance of the content of submission to class material and aquaculture: 25 %
Always relate the topic to something in class *lecture*. Use specific language such as "Malecha said in lecture that aquaculture intensity is...This submission shows the opposite"

Quality of your analysis/critique: 25 %
Use specific analytical language. Answer the question posed by other postings. Don't just Repeat the summary, this is not analysis. Consult the website for example of previous years journal submissions that show good and bad analysis. Critique the material, for example say why you like something or not, why it's wrong, why it's right. Analyze and critique, make substantive comments.

Quality of your writing : 25 %
Use proper English, diction, style. No "oh wow man, extreme far out stuff, them there fish..". Use professional language. Punctuate well and do spell check (just kidding).

Overall assessment: 25%
Here I will give my overall impression of the submission. Allows me to assess the submission without being bound to the above criteria. Your submission may already have a good grade and may get a better one or your grade may also go up since you may think the individual items above were poor but that, overall, the submission deserves more than a summary of individual grading. *I won't use this section to lower a grade.*

Exams

Intra-term exams (180 points, ~ 30 % of course grade)

Final Exam (120 points, ~ 20 % of course grade)

Each intra-term exam during the semester is like a mid-term exam. There will be 60 points for each exam obtained from multiple choice questions. The questions will be taken from those that appear in the study exams posted on the Laumila site and from new questions. **Many questions will contain the images that appear in the Power Point slides shown in the lecture presentations and in the figures, tables, charts that appear in the text material.** This means you must have a mastery of the lecture and text material. Remember the exams are open book and can be taken on line at the Laumila site at your leisure anytime during the exam period, so it is not necessary to memorize the lecture material and text material but you must be familiar with it to do well on the exam. This means having your text and annotated lecture notes in an organized form so you can quickly reference them during the exam.

Each intra-term exam covers:

- Lecture material since the last exam or the beginning of the course.
- The text material posted on the Laumila site that pertains to the lecture material.
- A few items not specifically covered in the lecture and readings but which a person who has a good command of the lecture material and reading content will be able to answer.

The exams will be given through the course on Laulima site on the days listed in the course schedule:

Exam - 1 Tuesday, September 18, covers Introduction; Agriculture-Aquaculture

Exam - 2 Tuesday, October 23, covers The Profit Equation; Metabolism, Growth, Energy, Production, Yield, Critical Standing Crop, Carrying Capacity; Reproduction

Exam - 3 Tuesday, November 20, covers Reproduction; Water; Shrimp; Prawns

FINAL EXAM Monday-Friday, Finals weeks, December 12-16 covers everything

To take the intra-term exams you should log on to the Laulima site and go to the **“Test and Quizzes”** menu item and take the exam anytime from 6:00 am till midnight (12:00 pm) on the Monday and Tuesday of the “exam week”. You can take the Final Exam anytime during finals week, December 12-16.

There is no time limit for taking the exams. But once you submit the exam ***that is it!***

Studying for the Exams

This can be done by keeping up with reading the text material for every class, reviewing the old exams posted on the web site, and reviewing the exhibits from the past two years exams. These exhibits give you a hint to the type of questions that will be asked using the exhibits. Also, this year’s exhibits will be posted ahead of time, usually by the Friday before the exam giving you an opportunity to see what type of questions might be on the exam. If you know the exhibits “cold” it is quite likely you will do well on the questions that are asked about them.

Intra-term Exam “post mortem” Discussions

A part of the second section of class time after each intra-term exam will be devoted to discussing the exam questions in a exam “post mortem” discussion. *Class participation and challenges are encouraged and will credit as class participation.* Intra-term exams and the post mortem discussions that follows prepares you for the final comprehensive exam given in class during final exam week. The post mortems are very important since you can challenge the “official” answer. If your challenge is accepted by me and the consensus of the class you-and everybody else with that answer-will be given credit, as well as the people with the original “correct” answer. We argue in these sessions and its FUN....so bring your tolerance and a keen, cooperative, spirit to the post mortem sessions.

Exams are “Open Book”

Examinations are “open book” and you can use any professional material. **HOWEVER YOU MUST TAKE THE EXAMS BY YOURSELF. YOU ARE ON THE HONOR SYSTEM AND ARE REQUIRED TO ACKNOWLEDGE THIS AT THE BEGINNING OF EACH EXAM.**

Course Evaluation

I would appreciate it if you would evaluate the course through the College of Tropical Agriculture and Human Resources (CTAHR) CAFÉ evaluation system. This is a web based system that takes only a few minutes to answer evaluation questions by checking boxes. The CAFÉ system will be open towards the end of the semester @ <http://www.hawaii.edu/ecafe>. Course evaluations are important to improving the course from year to year. The evaluations are voluntary and your cooperation will be greatly appreciated, but more importantly will help improve the course.

GOOD LUCK AND WELCOME TO THE CLASS!!

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AGREEMENT ON THE USE OF LAP TOP COMPUTERS in

Aquaculture Production (ANSC/OCN 450) , Fall 2012

I, _____ , (print your name)

agree to use my laptop computer in the Aquaculture Production (ANSC/OCN 450) lecture class only for taking notes from the Power Point slides presented in class.

I understand that the class has a zero tolerance policy that does not allow any other use of the laptop (such as emailing, texting, facebook checking, doing other work not related to the Power point lectures etc.) and that if I am found to violate the class policy my grade may be reduced, I may be asked to leave the classroom, and/or asked to drop the class.

Signed

_____ (signature)

_____ (date)