Aquaculture
In-House Winter Session 2 (March 30 – April 24, 2015)
Lecture: Monday and Thursday
Classroom: Forman 120

Professor: Dr. Joana Figueiredo
E-mail: jfigueiredo@nova.edu
Office: OC CoE Room 219
Office Hours: I am generally at the office from 9am to 5pm on weekdays (if possible, please e-mail me before coming to see me)
Phone: 594-262-3638

*The best way to contact me is by e-mail. I will do my best to reply within 24 hours. To ensure a prompt response from me, put AQ in the subject line of your e-mail.

Description: This course will give the student an understanding of the basic principles of aquaculture, including production systems, water quality, nutrition, spawning, larval culture and grow-out, and culture methodologies of fish, reptiles, invertebrates (zooplankton, molluscs, crustaceans, corals) and algae. The course will consist on a series of lectures followed by readings for each learning topic and paper discussions. The students will have the opportunity to conduct hands-on activities associated with the culture and husbandry of animals.

Learning outcomes

Students will be able to:

- Describe the different types of aquaculture systems
- Understand conditioning factors and how they can be manipulated
- Describe water depuration mechanisms
- Describe basic culture methodologies, common problems and solutions of commercially important species (including auxiliary culture species and ornamentals):
  o Microalgae
  o Macroalgae
  o Zooplankton (Artemia, rotifers, copepods)
  o Molluscs (Gastropods, Bivalves)
  o Crustaceans
  o Fish
  o Reptiles (turtles, alligators)
  o Coral
  o Other marine animals cultured for research or ornamental industry
- Understand the environmental impacts of aquaculture
Textbook:


None of the books listed is obligatory or covers all the topics that this course will address. Books 1-3 are general aquaculture books and were listed by order of usefulness, book 4 might be helpful for practical components of the class.

Class format:

Most themes will be covered in a lecture (using power point and old fashioned school board writing), and may be followed by a discussion of scientific articles relevant to the lecture theme. Active classroom discussion on selected scientific articles is mandatory. Relevant questions and themes discussed will be summarized on the board by the students (under the professor’s guidance).

Evaluation

Breakdown

Midterm (1 h): 25% (covers all themes lectured until April 6: combination of multiple choice, short answer and short-essay questions)
Final: 40% (covers all themes lectures from the first to last class: combination of multiple choice, short answer and short-essay questions covering the all course)

Make-up exams: let me know as soon as possible and before the midterm occurs if you know you will be absent the day of a midterm.

Valid excuses for missing a quiz include:

a) Documented illness
b) Documented family or personal tragedy
c) Documented official University business

Make-up exams will consist entirely of essay questions.

Classroom participation: 10%

Project: 25% (10% written + 15% presentation/video). The project should consist of the description of the culture methodology for research or ornamental industry of a marine animal species through its life cycle, including
- production system(s) (1.5%)
- abiotic and biotic rearing conditions (1.5%)
- nutrition and feeding (1.5%)
- reproduction (1.5%)
The written description should have a maximum 2 page (references should be listed outside the 2 pages range). The presentation should take around 15 min and can be a powerpoint presentation or previously recorded video (you may use VideoScribe, e.g. free version of Sparkol). Students may choose to air up to complete this project. If the student decides to develop the project by itself, it should present the culture methodology of at least one species; pairs need to present the culture methodology of at least two species.

**Grading**

A (90-100%); B (80-89%); C (70-79%); D (60-69%); F (0-59%)

**Class Etiquette**

Cell phones must be off at all times.
If you intend to use your laptop or tablet to take notes, please keep internet off or tablet on airplane mode.
Come to class on time. If you come late, take the first available seat, and sit next to a new friend.

**Academic honesty**

Do not copy other people’s work! It’s not worth it. I’ll catch you. Any person caught cheating will be reported to the Dean of the OC and will receive an F for that assignment or quiz.

**How to succeed in this course**

1. Read this syllabus
2. Attend all lectures and start working on your project early on
3. Do all assigned readings
4. For each hour of class, dedicate 2h of study/homework/readings.
5. Study in groups
6. If you have questions, share them with the class or contact me by e-mail.
7. If you need help, **ask** immediately

**Lecture Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>March 30</td>
<td>Course presentation (introduction and explanation of student’s project)</td>
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<tr>
<td></td>
<td>Aquaculture definition</td>
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<tr>
<td></td>
<td>Purpose: Commercial (Food and Ornamental), Research, Active</td>
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<td></td>
<td>restoration/conservation</td>
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<td></td>
<td>Brief historical perspective and current status</td>
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<td></td>
<td>Aquaculture production systems</td>
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<tr>
<td>April 2</td>
<td>Conditioning factors: water quality, temperature, salinity, pH, turbidity, oxygen, disease/prophylaxis and nutrition</td>
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<td>Date</td>
<td>Topic</td>
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<tr>
<td>April 6</td>
<td>Water quality and treatment: decantation, mechanic filtration, biological filtration, chemical filtration and sterilization)</td>
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<tr>
<td>April 6</td>
<td>Nutrition through the life cycle (live vs. processed food)</td>
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<td>April 6</td>
<td>Culture: Microalgae and Macroalgae culture</td>
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<td>April 6</td>
<td>Auxiliary cultures: Artemia, rotifers and copepods</td>
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<td>April 6</td>
<td>Enrichment processes</td>
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<td>April 9</td>
<td><strong>Midterm</strong></td>
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<tr>
<td>April 9</td>
<td>Culture: Bivalve and Gastropod Mollusca (oyster, clam, mussels, scallops, )</td>
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<tr>
<td>April 9</td>
<td>Culture: Crustaceans (shrimp, lobsters, crabs, crayfish, abalone, conchs, Trochus)</td>
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<tr>
<td>April 13</td>
<td>Culture: Fish (fresh and seawater)</td>
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<tr>
<td>April 16</td>
<td>Culture: Fish (fresh and seawater)</td>
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<tr>
<td>April 16</td>
<td>Culture: Coral and Reptiles (turtles, alligators, frogs)</td>
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<td>April 16</td>
<td>Aquaculture Business</td>
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<td>April 16</td>
<td>Environmental Impacts</td>
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<td>April 16</td>
<td>Questions about Final</td>
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<td>April 20</td>
<td><strong>Presentation of Students’ Projects</strong>: Culture of marine animals for research or ornamental industry</td>
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<tr>
<td>April 23</td>
<td><strong>Final</strong></td>
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**Readings** for each class will be sent to the student NSU e-mail 5 days prior to each class and are mandatory. Students will have to read 3 papers (at choice) per class from the list provided by the professor.