

SYLLABUS
Biology of Fisheries and Aquaculture Invertebrates
FAS 6932
Summer C, 2013

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Course Description

This course will introduce the student to the biology of the non-vertebrate marine and aquatic animals that humans harvest or culture. Invertebrate animals (e.g. mollusks, crustaceans, echinoderms) comprise about 99% of described animal species, and many are important fisheries and some are increasingly important in aquaculture. Invertebrates are more anatomically and biologically diverse than finfish, and this diversity must be understood in order to study their fishery management or aquaculture.

This course will examine the biology of marine and freshwater invertebrates that are important as fisheries or in aquaculture. Topics will include taxonomy, morphology, distribution and habitat, nutrition, significant ecological interactions, and life cycles. Non-food fisheries, such as commercial sponges and pearl oysters, will also be included. The course will be organized by taxonomic groupings, or phyla. Topics have been chosen for their biological relevance to fisheries and aquaculture, but procedural topics (fishery or culture methods, management, models, etc.) and pathology, which are covered at least partially by other courses, will not be emphasized here.

Reading Materials and Resources

There is no required textbook. The following texts are suggestions only. I know of no textbooks that focus on the biology of fishery invertebrates in general, although there are many that cover a specific fishery group. The inclusion of lab manuals here does not imply we will have a lab section; they are simply for your reference. Additional texts or manuscripts for specific topics will be noted during the course.

- Brusca, R.C. and G.J. Brusca. 2003. Invertebrates. 2nd Ed. Sinauer Associates. Sunderland, MA, USA. 936 pp. ISBN-10: 0878930973. \$114.71 from the publisher as of 4-16-13.
- Nybakken, J.W. 1996. Diversity of the Invertebrates: A Laboratory Manual. Gulf of Mexico Version. McGraw Hill, Boston, MA, USA. 320 pp. ISBN-10: 0697151239. *Price unavailable from publisher.*

- Pechenik, J.A. 2010. *Biology of the Invertebrates*. 6th Ed. McGraw Hill, Boston, MA, USA. 606 pp. ISBN-10: 0073028266. \$189.67 from the publisher as of 4-16-13.
- Ruppert, E.E., R.S. Fox, and R.D. Barnes. 2003. *Invertebrate Zoology*. 7th Ed. Brooks-Cole, Belmont, CA, USA. 989 pp. ISBN-10: 0030259827. \$229.99 from the publisher as of 4-16-13.
- Wallace, R.L. and W.K. Taylor. 2002. *Invertebrate Zoology Lab Manual*. 6th Ed. Benjamin Cummings, San Francisco, CA. 356 pp. ISBN10: 0130429376. \$103.80 from the publisher as of 4-16-13.

Wikipedia is a useful and mostly reliable source of information for some common species of invertebrates, but it should never be used as a reference. You may use Wikipedia to find original references, but Google Scholar (<http://scholar.google.com/>) and PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>) are examples of more comprehensive tool for finding resources. The only Internet resources you should cite directly in a report or paper (not just in this course, but any time) are online versions of published research papers or review articles in reputable journals, and WoRMS (see below).

Taxonomy is a rapidly advancing field and even online resources such as Wikipedia may not represent the latest revisions. The most reliable taxonomic resource for marine invertebrates is probably the World Registry of Marine Species (WoRMS, <http://www.marinespecies.org/>). Unfortunately, there is no comparable resource for freshwater invertebrates.

Quizzes and Exams

Quizzes - Each week (starting with the second) that there is not a larger exam, there will be a timed quiz with five multiple-choice questions taken from the prior week's material. You can use your notes or any other resources to answer the questions but there will be only five minutes for the entire quiz. You may take the quiz any time in the week following the material covered. There is no make-up if you miss the deadline.

Exams - There will be three exams, following Week 5, Week 10, and at the end of the course. The first two exams will cover the material from the prior five weeks, and the final exam will be comprehensive. As with the quizzes, you may use any materials to answer the questions, but the exams will be timed and there will be no make-up without prior arrangement. The questions will mostly be short-answer, although the instructor reserves the right to include other formats.

Reports. Two species reports will be required, one due halfway through the course, and one at the end. Each will be on a single species or, possibly, several closely related species that comprise a

single fishery. For the first report, the student will be assigned a species by the instructor; for the second report, the student may choose a species, but it must be approved by the instructor. The topic chosen does not have to be a fishery or aquaculture species, but should somehow be closely tied to fisheries and aquaculture. The reports must be succinct but well-referenced. More information on reports will be provided separately.

Schedule of Topics – subject to change as necessary

Course Introduction, Sponges

(no quiz)

Precious Corals, Jellyfish

Quiz 1

Rotifers, Annelids, and Peanut Worms

Quiz 2

Mollusks: Introduction and Gastropods

Quiz 3

Mollusks: Bivalves

Exam 1 (no quiz)

Mollusks: Bivalves

Quiz 4

Mollusks: Cephalopods

Quiz 5

Arthropods: Horseshoe Crabs and Introduction to Crustaceans

Quiz 6

Crustaceans: Shrimp and Prawns

Exam 2 (no quiz)

Crustaceans: Lobsters and Crayfish

Quiz 7, Report 1 due

Crustaceans: True Crabs and King Crabs

Quiz 8

Echinoderms

Quiz 9

Echinoderms

(no quiz)

Final Exam, Report 2 due

Grading

The course grade will be based on points scored, broken down as follows:

Quizzes - 9 x 5 points	45 points
Exam 1	30 points
Exam 2	40 points
Final Exam	60 points
Report 1	20 points
Report 2	40 points
Total	235 points

Grades are based on a percentage of the above points; there is no curve.

93% (233 points) and above = A

90% = A-

88% = B+

83% = B

80% = B-, etc.

Online Interactions

The lecture material, in the form of narrated Power Point presentations, will be prepared in advance and will not be live. Unless specifically requested on an individual basis, interactions between students and instructor will be via email (pkbaker@ufl.edu), or during office hours via Skype. Office hours will be negotiated at the beginning of the course based on the availability of students.

From the University of Florida

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and*

integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.