

Fisheries Biology (Bio 173): Course Information**Fall 2015****Instructor:**

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Course Location & Times:

Lec: #85456	Mon, Wed 1:00 to 1:50pm	Room 124 HMB
Lab: #85457	Mon 2:00 to 5:00pm	Room 124 HMB

Enrollment is limited to 24 students. Each student must attend both the lecture and laboratory portions of the course.

Office hours:

Ron Coleman	Wed 2:00 - 5:00pm	Room 119 HMB
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What this course is about:

The world's fisheries constitute a vital resource, providing food, employment and recreation for millions of people. Despite this importance, our ability to effectively manage fish populations is hampered by several key problems: we know remarkably little about most fishes, even fishes which have been fished for centuries, and worse yet, we have limited means of estimating and/or predicting the number of fishes available for us to take largely because fish are underwater and we are not.

The central problem of fisheries biology and management becomes: how do we understand populations about which we lack such key information? Because people will continue to fish whether we have the necessary information or not, we are forced to make the best possible decisions based on the information we do have.

At one time, fisheries science was simply the study of how to catch fish and how to stock farm ponds with bass or catfish. Not so anymore. Modern fisheries science is a dynamic, complex science that incorporates sophisticated mathematics and computer modelling to try to understand natural populations and the impact of fishing on those populations. It is firmly grounded in population ecology and increasingly focussing on conservation as a goal.

While fisheries science is quite old, the widespread availability of microcomputers has dramatically affected fisheries management, allowing much more sophisticated analysis than was possible in the past.

This course will focus on understanding why fisheries management is difficult, what techniques have been proposed to approach the problem and the practical tools fisheries biologists need to know to apply these techniques.

This is NOT a course on how to catch big bass or more salmon.

Also, this is NOT a general ichthyology course, i.e., a course on the biology of fishes. Bio 162 (offered alternate years in the fall) is the Ichthyology course. This course (Bio 173) complements Bio 162.

Learning Objectives:

Conceptual

- Understand the important issues facing world fisheries and why there are no simple solutions
- Appreciate the diversity of fisheries around the world
- Recognize that modern fisheries is a mixture of applied ecology and conservation biology
- Recognize that fisheries science has a history of conceptual thought and is continually evolving

Practical

- Research and compose a well thought-out term paper on a topic related to fisheries biology, making use of the primary literature
- Learn to use a scientific key efficiently and effectively
- Identify a variety of local freshwater and marine species (native and introduced) that a person involved in fisheries might need to know
- Learn to obtain standard scientific data from fish (e.g., weight, length)
- Learn to use a spreadsheet program (i.e., Microsoft Excel) to keep track of and present information
- Learn to use a spreadsheet to model population processes
- Work with simple mathematics and statistics to understand and interpret fisheries data (e.g., catch equations)
- Be able to work with simple data sets to predict how much fishing should occur under various scenarios
- Learn the value of good data versus large amounts of bad data

Attendance and Deadlines:

I expect you to attend every lecture and lab; you miss class at your own risk. Anything I say is fair game for exams, whether it is in the text or not. Some things I say will definitely not be in the text, and some may contradict the text. In the latter case, what I say is taken to be the correct answer. If there is a difference between what I say and what is in the text or what you have learned elsewhere, **please ask about** it in lecture or after class and we will discuss the differences.

My goal as a lecturer is to guide and assist you in learning about this material. I cannot do that if you aren't in class or if you don't tell me what you don't understand.

If you do miss a class, it is your responsibility to get the notes from another student, not from me. I DO NOT hand out lecture notes, nor do I post them to the web.

Deadlines are strictly adhered to. It is not fair to students that complete work on time for other students to have extra time to do the same work. Plan ahead and schedule your time. Most importantly, don't leave things to the last minute; you don't need that kind of stress!

Textbook:

Jennings, S., Kaiser, M.J., Reynolds, J.D. 2001. Marine Fisheries Ecology. Blackwell Science, Malden, Mass. **REQUIRED.**

Exams:

There will be two midterms and a final for the lecture portion of the course. There will be a midterm and a final in the lab, both held during lab time. Midterms are held during the lecture period and will be a mixture of fill-in the blank, short-answer and essay questions. I do not believe in multiple choice questions and do not use them.

Exams will be comprehensive, i.e., anything in the whole course up to that point in time is fair game. My previous students comment on two aspects of my exams: I am a hard grader but I am a fair grader. You can expect long exams that test your knowledge, but they will be exams without tricks. My goal is to have you tell me what you know and understand. You will write a lot and you will have to work very quickly.

Labs:

The "Labs" constitute exercises that you must typically complete in the lab and then turn in for grading. When you get a lab back it will either have a checkmark in the upper right or not. If it does not, then you must correct anything indicated and turn the lab back in. You keep doing this until you get everything correct.

It is your responsibility to make sure that you have completed all of the labs.

NOTE: You must retain in some orderly fashion all assignments and graded materials until after the end of the semester. You may be asked to produce these at the end of the semester. Failure to produce an assignment will result in a grade of 0 for that assignment.

Grading:

This course is worth 3 units.

The number of points/questions on a particular exam is irrelevant to the exam's worth -- it is merely a tool for grading. What matters are the following percentages.

Your lecture grade will be calculated according to the following scheme:

Midterm I	20
Midterm II	25
Final Exam	35
Term Paper	20

	100%

Your lab grade will be calculated according to the following scheme:

Midterm	25
Final	25
Labs	50

	100%

Your course grade will be a combination of your lecture and lab grades as follows:

Lecture	2/3	Lab	1/3
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Your letter grade will be calculated according to the following table:

A = 93 to 100%	C+ = 77 to 79.9%
A- = 90 to 92.9%	C = 73 to 76.9%
B+ = 87 to 89.9%	C- = 70 to 72.9%
B = 84 to 86.9%	D+ = 67 to 69.9%
B- = 80 to 83.9%	D = 60 to 66.9%
	F = 0 to 59.9%

I generally do not adjust or curve or scale grades; If you want an "A", work for it and make it happen!

I do not hesitate to correct any errors I make in grading (e.g., incorrect addition or if I missed grading an answer), but keep in mind that I am looking for clear, succinct answers, not answers that sort-of-show-you-possibly-might-know-what-you-mean. If you feel that your answer deserves a better grade, please return it to me promptly.

I do not use "extra credit" assignments.

Care of Specimens:

In this lab you will be handling some specimens from the fish collection of CSUS. Please treat these specimens with the utmost care. Damage to specimens is cumulative, i.e., if you damage the fin of a fish, then that fin will remain damaged for all subsequent students this year and every year into the future.

Health and Safety:

Read and sign the Safety sheets (you will get these in lab).

Honor Code:

Don't cheat. Besides the fact that I will be forced to take strong measures if I catch you -- including recommending your dismissal from the class and from the university -- I will be profoundly disappointed in you.

Don't even think about doing any of the following:

- Giving or receiving information from another student during an examination
- Using unauthorized sources for answers during an exam such as writing answers on hats, clothing or limbs
- Illegally obtaining the questions before an exam
- Altering the answers on an already-graded exam
- Any and all forms of plagiarism
- Destruction and/or confiscation of school and/or personal property

Feedback:

I appreciate your feedback on this course. It is most useful to tell me things while the course is in progress, rather than waiting until the end of the course. If there is something that needs changing, LET ME KNOW and I will see what I can do about it. This course is a collaboration between you and me. I enjoy teaching this class and I want you to have a good time as well and learn as much as you possibly can.

Tentative list of lecture and lab topics. The list is subject to change.

Week	Mon	Wed
1	Aug 31: Intro to course Lab: Intro to keying; Excel for Fisheries; Grade Calculator; Constructing Graphs w/Excel	Sept 2: What is a fishery? History of fisheries
2	Sept 7: Labor day – no class	Sept 9: History continued
3	Sept 14: Diversity of fisheries Lab: Regression Lines; CA Native Freshwater fishes	Sept 16: Management goals; Basic problems
4	Sept 21: Fisheries cycle, Ecology and production processes Lab: von Bertalanffy	Sept 23: Life history, growth, von B ***Term paper proposal due, 1pm
5	Sept 28: Lecture Midterm #1 Lab: keying catchup	Sept 30: Maturity, Longevity, fecundity
6	Oct 5: Exam analysis, semelparity, iteroparity Lab: Measuring fish	Oct 7: migration/diadromy
7	Oct 12: Lab Midterm	Oct 14: recruitment
8	Oct 19: early life history Lab: Drawing Functions on Graphs, CA Introduced FW fishes	Oct 21: density dependence
9	Oct 26: Lecture Midterm #2 Lab: Spawner recruit models; Reading scales	Oct 28: MSY (Maximum sustainable yield)
10	Nov 2: CPUE, non-equilibrium methods Lab: Market fishes; yield per recruit ***Term paper PART 1 due, 1pm	Nov 4: Catch equations, Virtual population analysis
11	Nov 9: Yield per recruit models	Nov 11: Veterans' Day – no class
12	Nov 16: Field trip to Nimbus hatchery ***Term paper due, 1pm	Nov 18: Multispecies fisheries, Ecosystem models
13	Nov 23: Biological Interaction Lab: mark and recapture; GIS	Nov 25: Effects of fishing on populations
14	Nov 30: Bycatch Lab: Bycatch	Dec 2: Bycatch
15	Dec 7: no lec? Lab Final	Dec 9: Review
16	Dec 14: 12:45-2:45pm FINAL EXAM	

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