Fisheries Biology (Bio 173): Course Information

Fall 2021

Instructor:

Dr. Ron Coleman	Pronouns:	he, him, his
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Course Location & Times:

Lec:	#85918	Mon, Wed	1:00 to 1:50pm	Room 124 HMB
Lab:	#85919	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.

Course Format:

This course is offered face-to-face, i.e., in person. It is not offered virtually or in a hybrid format. In other wods, you have to show-up in-person in the classroom.

Office hours:

Ron Coleman	Wed 2:00 - 5:00pm	Room 119 HMB

Catalog Description:

BIO 173. Principles of Fisheries Biology. 3 Units. Introduction to the biological principles basic to fisheries science, including enumeration, recruitment, growth, abundance and mortality. Mathematics, computer modeling, and field methods will be used to understand natural populations and the impact of fishing on those populations in keeping with modern approaches to fisheries science which are grounded in population ecology and conservation biology. Lecture two hours; laboratory three hours.

Fee course.

Prerequisite(s): BIO 160, STAT 1 or permission of the Instructor

Term Typically Offered: Fall only – odd years

Offered by Department of Biological Sciences, College of Natural Sciences and Mathematics

Course Description:

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, modern fisheries employs modern technology (computers, GPS, GIS, database systems, modeling, etc) and these have 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 Outcomes:

Upon successful completion of this course, the student will be able to do the following:

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 are not 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, do not leave things to the last minute; you do not need that kind of stress!

Course Materials (Email and CANVAS):

This course uses both the CANVAS Learning Management System and email extensively. As a Sac State student, you are responsible for regularly checking your Saclink email account (i.e., daily). Failing to do an

assignment because you did not check your Saclink email account or CANVAS is your problem. Furthermore, when corresponding with me about this course, you MUST use your Saclink email account, not a gmail, yahoo or any other email account. This is an official University policy (IRT-0102, January 1, 2010).

Handouts for labs and the term paper, and some videos are found on CANVAS. Anything on the CANVAS site is "testable", i.e., the material may appear on an exam.

I do not use the scheduling features of CANVAS to keep you informed of what you have done and what you still need to do. Keeping track of your assignments is your responsibility. This is not high school. Similarly, I do not use the grade book facilities of CANVAS. This is deliberate.

Do NOT send me messages within the CANVAS system. I will not read them. Send any email messages to me directly at rcoleman@csus.edu

When sending me an email, think carefully about the subject line and the names of any file attachments. I get hundreds of emails a day. Sending me a filename such as "assignment.docx" is a waste of time – I will delete it. File names should have your name included in the filename. For example, a far better filename would be "Coleman_Ronald_Bio169_termpaper_proposal.docx" You need to get into the habit of using descriptive filenames and subject lines in all your work and correspondence.

Equally importantly, be sure that every document that you send me has your name inside of it, not just in the filename, and also includes the current date, i.e., the date you are submitting it. Do NOT put the date it is due; I already know that. You need to put the current date in the document so that you and I can keep track of which version you are sending me (see below under Writing and Revision). So for instance, when you first submit your term paper proposal, it might have a date of September 12, 2021. When you revise it a week later, the date would now say September 14, 2021, making it easy for you and I to see which version is the newer version.

NEVER, EVER "share" files with me or send me links to documents. I will not read "shared" files. You must attach any documents/spreadsheets/pdfs to an email and send that to me. The reason for this is that certain shared documents and linked documents can change after you send them. I cannot grade material that can potentially be changed after you submit it.

It is also critical that you not send unrelated things in the same email, e.g., "Here is assignment 2 and my term paper proposal." Send each one as a separate email. This makes it much easier for me (and you) to track what is done and what needs to be done. By the way, this is excellent advice for all email correspondence: one email, one topic. Sending multiple, unrelated things in a single email pretty much guarantees that one of them will be ignored or misplaced.

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 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.

I do not provide separate "study guides" for exams. This course is an introduction to the subject of Fisheries Bioloy; the lectures and the labs are your study guides to that material.

Writing and Revision:

Good writing is the absolute most important skill you can develop in college. It is one of the key questions employers ask about potential employees: employers can teach you how to use a new machine or a new type of analysis, but they are not interested in teaching you how to write. Writing skill often determines your success in your career. The bad news is that most college students are not good writers. I suspect this is because of the proliferation of multiple-choice exams, and the lack of opportunities to practice extensive

writing or to receive critical feedback. The good news is that you can easily learn to be a better writer. I will help you with this. You will do a lot of writing in this course, during exams, for the term paper and for the lab assignments. I do not accept poor writing. If you turn in an assignment which is poorly written or with spelling or grammatical errors, I will return it to you to revise. I will keep sending it back to you until it is correct. I do not expect you to be perfect at first, but I do expect you to learn from your mistakes.

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, at which point you will get a checkmark.

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

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:

Do not 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:

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

Services to Students with Disability (SSWD):

Sacramento State is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class (including pregnancy-related disabilities), please immediately contact Services for Students with Disabilities (SSWD) to discuss eligibility. A current accommodation letter from SSWD is required before any modifications, above and beyond what is otherwise available for all other students in this class, will be provided. Please be advised that disability-related academic adjustments are not retroactive. SSWD is located on the first floor of Lassen Hall 1008. Phone is 916-278-6955 and email is sswd@csus.edu. For a complete listing of services and current business hours visit https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/

Student Health and Counseling Services:

Your physical and mental health are important to your success as a college student. Student Health and Counseling Services (SHCS) in The WELL offers medical, counseling, and wellness services to help you get and stay healthy during your time at Sac State. SHCS offers: Primary Care medical services, including sexual and reproductive healthcare, transgender care, and immunizations; urgent care for acute illness, injuries, and urgent counseling needs; pharmacy for prescriptions and over-the-counter products; mental health counseling, including individual sessions, group counseling, support groups, mindfulness training, and peer counseling; athletic training for sports injury rehabilitation; wellness services, including nutrition counseling, peer-led health education and wellness workshops, and free safer sex supplies; violence and sexual assault support services. Most services are covered by the Health Services fee and available at no additional cost.

Crisis Assistance & Resource Education Support (CARES):

If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away. The CARES office provides case management support for any enrolled student.

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 30: Intro to course Lab: Intro to keying; Excel for Fisheries; Grade Calculator; Constructing Graphs w/Excel	Sep 1:What is a fishery? History of fisheries
2	Sept 6: Labor day – no class	Sept 8: History continued
3	Sept 13: Diversity of fisheries Lab: Regression Lines; CA Native Freshwater fishes	Sept 15: Management goals; Basic problems
4	Sept 20: Fisheries cycle, Ecology and production processes Lab: von Bertalanffy	Sept 22: Life history, growth, von B ***Term paper proposal due, 1pm
5	Sept 27: **Lecture Midterm #1** Lab: keying catchup	Sept 29: Maturity, Longevity, fecundity
6	Oct 4: Exam analysis, semelparity, interoparity Lab: Measuring fish	Oct 6: migration/diadromy
7	Oct 11: **Lab Midterm**	Oct 13: recruitment
8	Oct 18:early life history Lab: Drawing Functions on Graphs, CA Introduced FW fishes	Oct 20: density dependence
9	Oct 25: **tba** **Lab:** Spawner recruit models; Reading scales ***Term paper PART 1 due, 1pm	Oct 27: MSY (Maximum sustainable yield)
10	Nov 1: **Lecture Midterm #2** CPUE, non-equilibrium methods Lab: Market fishes; yield per recruit	Nov 3**:** Catch equations, Virtual population analysis
11	Nov 8: Yield per recruit models	Nov 10:
12	Nov 15:	Nov 17: Multispecies fisheries, Ecosystem models ***Term paper due, 1pm
13	Nov 22: Field trip to Nimbus hatchery (?) Lab: Size Spectrum	Nov 24: Biological Interaction, Effects of fishing on populations
14	Nov 29: Bycatch Lab: Mark and recapture; GIS?	Dec 1: bycatch
15	Dec 6: no lec? **Lab Final**	Dec 8: Review
16	Dec 13: **12:45-2:45pm FINAL EXAM**	

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