

Ichthyology (Bio 162): Course Information

Fall 2020

Instructor:

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Course Location & Times:

Lec: #85830 1 hour, two times a week, asynchronously online, lectures will be posted M, W
 Lab: #85831 3 hours once a week, asynchronously online, posted M
 Exams: *12:45pm - 2:45pm on Oct 26 and Dec 14 (online)

* if these times are not possible for you, you need to let me know as soon as possible so that we can make other arrangements

Each student must attend both the lecture and laboratory portions of the course.

Office hours:

Ron Coleman Wed 2:00 - 5:00pm setup an appointment by email or for Zoom. Email for other times.

Catalog description:

BIO 162. Ichthyology: The Study of Fishes. Biology of fishes: structure, physiology, ecology, economic importance, propagation and classification. Methods of identification, life history study, propagation, collection and preservation. Lecture two hours; laboratory three hours. Field trips may be required. Fee course. Prerequisite: BIO 1 and BIO 2. Graded: Graded Student. Units: 3.0

What this course is about:

This course is about the amazing world of fishes. Fishes are the most diverse and most abundant vertebrates on this planet with over 32,800 species; that is more than all other vertebrates combined. The purpose of this course is to introduce you to this incredible biodiversity with an aim to understanding how fishes evolved and how they exist in the modern world. The focus will be on topics like ecology, evolution and behavior, with some discussion of anatomy and physiology.

Learning Outcomes:

Upon completing this course, a student will be able to do the following:

Conceptual

- Describe and explain the processes of natural selection, speciation, sexual selection
- Describe the diversity of fishes, the largest group of vertebrates
- Describe the phylogeny of fishes
- Understand modern approaches to phylogeny (i.e., cladistics) and taxonomy
- Explain the anatomy of a fish
- Describe the relationship between form and function, using examples of fish adaptations
- Describe and explain behavioral adaptations of fishes
- Explain the relationship between phylogeny and distribution, i.e., phylogenetic biogeography

Practical

- Recognize, find and read primary scientific literature
- Research and compose an ichthyological term paper, using the primary literature
- Present information in the form of a scientific poster
- Be able to construct and analyze simple cladograms
- Use a scientific key efficiently and effectively
- Use scientific nomenclature properly

Become proficient with field guides for fishes, and the information contained therein
Identify a core group of fishes (both local and from around the world)
Identify and describe the skeletal and soft anatomy of fishes

Attendance and Deadlines:

Normally, I would say something like: I expect you to attend every lecture and lab; you miss class at your own risk. This time, due to the asynchronous lectures, you can do things when you like; however, it is critical that you keep up. This is not a good course to “binge watch” just before the exams.

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 do not attend the video lectures or if you do not tell me what you do not understand.

Your lectures will be posted online. They will cease to exist the night before the exams so I strongly encourage you to take detailed notes.

REALLY IMPORTANT NOTE: Online lectures remain the property of the instructor (i.e., me). You may not copy or distribute them and you certainly may not post them to a different online site. Doing so constitutes theft and you will be prosecuted as such.

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!

If you get sick, due to the Corona-virus, or something else, let me know and we will make alternate arrangements.

Email policy:

This course uses both CANVAS and email extensively. As a Sac State student, you are responsible for regularly checking your Saclink email account (i.e., at least daily). Failing to do an assignment because you did not check your Saclink email account 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).

Textbook:

Helfman, G.S., Collette, B.B., Facey, D.E. and B.W. Bowen. 2009. *The Diversity of Fishes*. Biology, Evolution and Ecology. Second Edition. Wiley-Blackwell, New Jersey. ISBN: 978-1-4051-2494-2 **REQUIRED**. (You need the second edition, the first edition is not appropriate)

Exams:

There will be one midterm and a final for the lecture portion of the course, held at a specific time. The questions will be a mixture of short-answer and essay questions. I do not believe in multiple choice questions and do not use them. There will be a midterm and a final in the lab, both held at a specific time. Questions will be a mixture of fill-in-the-blank and short-answer questions.

To complete the exams, you will need to edit documents electronically, using Microsoft Word, or scan your work and produce a .pdf file to email to me. In the worst case, you may send me .jpg files of your exam pages. I will not accept material in any other form (e.g., .pages files).

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 and 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 have to work very quickly.

Term Paper:

The term paper is an integral part of this course. It is your opportunity to explore a particular topic about fishes in depth. You will receive a separate lengthy handout that describes the details and process of writing the term paper, but the key parameters are as follows. You will find and read four pieces of primary

literature on a topic of your choosing (related to fishes). You will write an initial proposal (approximately 100 words) early in the semester. A little later, you will turn in a "part I" which includes the analysis of one of your primary sources (approximately 600 words) and finally you will turn in the full term paper towards the end of the course; it will include analysis of all four primary sources (minimum 1500 words). After the first two stages, you will receive constructive feedback to allow you to produce a quality final product. In doing so, you will have had to correctly identify primary scientific literature (as opposed to other kinds of writing), read at least four pieces of primary scientific literature, analyzed it, thought about it, and written about it using the appropriate style and form for scientific writing (including proper citation of your sources). This process will give you a much greater understanding of what science is and how it works.

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	35
Final Exam	45
Term Paper	20

	100%

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

Midterm	20
Final	20
Labs (including "Jars")	60

	100%

NOTE: You must retain in some orderly fashion all assignments and graded materials until after the end of the semester (i.e., January). 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.

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.

There are no "extra credit" assignments.

It is your responsibility to be aware of and understand University policies about drop dates, etc. For example, if you simply stop coming to class, you will be assigned an "F" for the course and you will not be allowed to "drop" the course after the drop deadline.

Honor Code:

Do not cheat. Besides the fact that we will be forced to take strong measures if we catch you -- including recommending your dismissal from the class and from the university -- I will be profoundly disappointed in you. Most importantly, **cheating indicates that you are a failure as a human being.**

Do not 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

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 really enjoy teaching this class and I want you to have a great time as well.

Additional Resources and Sources of Information:

Links to campus policies and resources related to student academics may be found on the www.csus.edu website

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| Policies: | Grading policies,
Sacramento State Academic calendar,
Hornet Honor Code
Student Rights Responsibilities |
| Resources: | Martin Luther King Center
Multicultural Center
Dreamer Resource Center
Student Success Center
Academic Advising
PARC
Reading & Writing Center |

Schedule:

Note the lectures are pre-recorded as video files. You may watch them anytime you like. Because of the way that they are made and due to some technical constraints, the lecture for one day, e.g., Sept 9, might appear as a series of videos, e.g., Lecture 3a, 3b, 3c, etc. Typically each of these recordings is about 17 minutes long. You need to watch ALL of the segments to complete that day's lecture.

This schedule of classes is subject to change.

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

Check dates

Week	Mon	Wed
1	Aug 31: Intro to class Lab: Intro to keying, Basic Excel	Sept 2: Diversity of Fishes, History of Ich
2	Sept 7: Labor Day – no class	Sept 9: Term Paper, Literature, Natural Selection, Family Exercise
3	Sept 14: Take-up Family Ex., Writing, Nat Selection Lab: Fish Anatomy, Key CA fish, Graphing, start bones	Sept 16: Directions of Selection
4	Sept 21: bone structure (part) Lab: jars	Sept 23: bone structure (part) Sexual selection ***Term paper proposal due, 1pm
5	Sept 28: bone structure (part) Sexual selection Lab: boiling fish heads	Sept 30: Species definition
6	Oct 5: allopatric speciation Lab: Malawi Cichlid DVD, fish head	Oct 7: phylogeny of fishes, sympatric speciation, isolating mechanisms
7	Oct 12: fish skull conceptually Lab: finish up lab stuff	Oct 14: rest of the skeleton
8	Oct 19: bone vs cartilage Lab Midterm	Oct 21: review
9	Oct 26: Lecture Midterm Lab: Video – Coelacanth	Oct 28: Actinopterygii part I ***Term paper PART 1 due, 1pm
10	Nov 2: Actinopterygii: part II Lab: weighing and measuring, regression	Nov 4: Actinopterygii part II
11	Nov 9: Actinopterygii part IV Lab: video (Sharks – Air jaws) , representative fishes, dissection	Nov 11: Veterans' Day – no class
12	Nov 16: Actinopterygii part V	Nov 18: muscles, electricity, hearts, gas bladders ***Term paper due, 1pm
13	Nov 23: buoyancy, osmoregulation, thermoregulation, freezing Lab: video (swordfishes), Scientific terminology, posters, representative fishes	Nov 25: diadromy, locomotion
14	Nov 30: senses Lab: representative fishes	Dec 2: senses
15	Dec 7: Biogeography Lab Final	Dec 9: tba
16	Dec 14: 12:45-2:45pm FINAL EXAM	

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