



Oregon State University Ecampus

Course Name: Ichthyology

Course Number: FW 315

Credits: 3

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Course Description

A survey of the diversity of biological adaptations of fishes. Topics include physiological and zoogeographical adaptations, reproduction, evolution, cladogenesis, morphology, behavior, and genetics. Prerequisites: One year of introductory biology

Course Credits

This course combines approximately 90 hours of instruction, online activities, and assignments for 3 credits

Technical Assistance

If you experience any errors or problems while in your online course, contact 24-7 Canvas Support through the Help link within Canvas. If you experience computer difficulties, need help downloading a browser or plug-in, or need assistance logging into a course, contact the IS Service Desk for assistance. You can call (541) 737-8787 or visit the [IS Service Desk](#) online.

Learning Resources

Required Textbook (free version available as e-text through OSU Library Services)

The Diversity of Fishes, second edition. 2009.

Gene Helfman, Bruce Collette, Doug Facey and Brian Bowen.

Recommended Textbook

McMillan VE. 2020. Writing papers in the biological sciences. 7th ed. Boston: Bedford/St.

Martin's. xv + 267p. This contains lots of advice on how to format and prepare scientific writing! It will be really useful for the paper assignment in this class.

Helpful Websites

[Dictionary of Ichthyology](#)

Brian W. Coad and Don. E. McAllister

The Dictionary of Ichthyology is a helpful online glossary of terms spanning the breadth of the field.

[FishBase](#)

Fishbase is probably the most complete online clearinghouse of data on fish species, including scientific names, life history information and photographs. Be a little careful in using it, as there's no guarantee that a curator has verified that all the photos are correctly identified in any given taxon. That said, its accuracy is pretty good overall.

[Catalog of Fishes](#)

The definitive source for scientific names of fishes, including information on who described them and in which journals.

Note to prospective students: Please check with the OSU Beaver Store for up-to-date information for the term you enroll ([OSU Beaver Store Website](#) or 800-595-0357). If you purchase course materials from other sources, be very careful to obtain the correct ISBN.

Measurable Student Learning Outcomes

We will study the anatomy, physiology, sensory biology, life history, diversity, evolution, behavior, and ecology of the fishes, the most diverse of all vertebrate groups and the dominant group of vertebrates in aquatic habitats. During this course, you will learn to:

1. Recognize the major anatomical features of fishes, describe their evolutionary origins and functional morphology, and explain how fishes use these adaptations for predation, defense, and communication
2. Synthesize information on the anatomical, physiological, sensory and behavioral attributes of fishes to explain how those attributes adapt them to life in aquatic habitats ranging from isolated lakes and swift rivers to the oceanic abyss
3. Describe the wide diversity of life history and reproductive strategies among fishes, and explain how ecological and evolutionary factors influence the strategy exhibited by each species and each sex, and
4. Synthesize information on anatomy, physiology, behavior, life history, genetics, ecology, geography and human dimensions to explain how and why fish species become threatened and endangered, and how scientists and managers use such data to conserve biodiversity.

Your progress towards meeting these course objectives will be evaluated with contributions to discussion boards, a multi-part writing assignment, and a series of quizzes and tests using multiple choice, true/false, multiple answer, fill-in-the-blank, and short answer/essay questions.

Aside from serving as a comprehensive introduction to the science of ichthyology, the course will provide a solid foundation in anatomy, physiology, evolution, life history, and ecology and will prepare you well for careers in fisheries science, ichthyology, aquaculture, oceanography or vertebrate biology.

Evaluation of Student Performance

The assignments and projects below comprise the assessment methods for this course.

- Introduction Questionnaire 10 points (bonus)
- Discussions – 20 points per week, 200 points total
- Writing Assignment – 250 points in several parts +10 bonus points
- Midterm Exam 1 – 100 points
- Midterm Exam 2 – 100 points
- Midterm Exam 3 - 100 points
- Final Exam – 250 points
- **Total – 1000 points. (+20 points bonus)**

Assignment Overviews

Intro Questionnaire

On the Canvas site, you will find a short questionnaire that will help you practice the online quiz procedure. There are a few optional questions designed to let your instructor get to know you a little better; you need not answer those if you really don't want to, but you must at least sign, enter your responses or "NA" in each text field, select one option for each non-text field question, and submit the questionnaire so that we can solve technical problems before you take the actual quizzes. If you encounter any technical difficulties, please let the HelpDesk (osuhelpdesk@oregonstate.edu) know immediately. It is not the instructor's responsibility to solve technical problems.

Discussion Boards

Each week (including during exam weeks), you will find a set of discussion boards that will pose some open-ended questions for you think about and debate with your classmates, or will present information-gathering tasks that ask you to go find examples to share with the class. You may either start a new thread or continue an extant thread with your comments, but please note that we are looking for well-thought out and reasoned postings, and would like you to interact with other people. Each substantive post should include at least 200 words (one to two paragraphs) and show some degree of mastery of the subject or a thoughtful consideration of the significance, ramifications, limitations, or implications of someone else's answer. You are welcome to ask other questions if they relate to the topic at hand and the goals of this course. Simply posting "I agree," "Go Beavers!" or "Fishes are Awesome!" is not sufficient! You will earn up to 20 points each unit for your contributions here. Overall 10 points are awarded for intellectual quality, 5 for meeting the length and timing requirements, and 5 for clarity, style and correctness of expression. Posting only once earns a maximum of ten points. A full rubric appears on Canvas.

To meet expectations (= **grade of B**) we ask that at a minimum you:

1. make at least *two substantive TOPIC posts* to these boards in total during each module,
2. engage with other students (this is in addition to your two substantive topic posts)
3. post at least one topic *by Wednesday* at midnight of each week, and
4. post again *by Sunday night* with a second topic post and first peer response.

To exceed expectations (e.g. **a grade of A**) you should post more than the minimum.

The discussion board questions aren't quizzes. Rather, they are open ended prompts designed to help you understand and really think about the material presented in the course. Think of the discussion board as a collaboration with your fellow students to generate ideas, synthesize information on fishes, bring in facts and examples from the course materials and outside sources, consider new perspectives, and improve everyone's overall understanding of fish biology, ecology, and evolution.

Special Note: There are more than two questions posed in each unit. You do not necessarily need to respond to all the questions posed, but you are responsible for reading and learning from all the threads. Concepts from ALL the discussion boards are fair game for exams, whether or not you posted to them personally.

Midterm Exams

Each of the three midterms will consist of multiple choice, multiple answer, true or false, fill-in-the-blank and short answer essay questions. *Each midterm stands alone*; material from the first section of the course will not be tested on the second midterm (though you can't forget basic concepts from the first section, such as how to interpret the phylogeny of fishes). The midterms are open book, but you'll have only a limited amount of time to respond to all the questions, so you'll still need to study up before taking them!

If you accidentally close the browser window while you are taking the test, you can log back into the exam with no problems, but note that the timer will continue to countdown. You cannot pause the test once you begin. Also note that you can have more than one tab open at a time, so you can have the exam open in one tab and another part of the course website open in another.

Note: Remember that you cannot simply cut and paste answers from the course or a website into the exam! This is plagiarism (see section on academic dishonesty below). In all cases you need to write out answers in your own words.

If you experience errors or problems during a midterm or final exam, contact 24-7 Canvas Support through the Help link within Canvas. You can reduce your chances of experiencing errors or problems by making sure that your computer has the required hardware and software to properly run the Canvas site. *Remember that it is your responsibility to meet the minimum computer specifications and browser requirements.* **I recommend performing a browser check before each exam!** Follow this link to complete a [browser check](#).

Final Exam

The open-book final will last *110 minutes* and will consist of multiple choice, multiple answer, true-or-false, fill-in-the blank and short answer questions, *and a single longer essay.* *The final is comprehensive.*

Writing Assignment: Design a Fish!

Throughout the term, we will talk extensively about fish adaptations and the amazing ways that fishes manage to live in every water habitat on earth. For example, in unit one we will learn how you can predict how a fish swims and hunts from its body and fin shape, in unit two we'll learn why some fishes have evolved the amazing ability to regulate their body temperature or move between fresh and salt water, and in unit three we will learn how a species' lifespan and habitat influences its reproductive strategy.

Your writing task this term will be to synthesize that information to create and describe a fish that doesn't actually exist, but could.

You will need to explain how its anatomy, physiology and reproductive biology adapt it to life in its niche and habitat.

You'll complete this assignment in several parts, submitting first a short concept statement, then a full draft for review by one of your peers, and finally a full version. The final version will be five to ten pages in length and must include a figure and at least five scientific references.

1. Write a one-page concept statement about your fish (30 points)
2. Submit a draft to Canvas (30 points) – you will be assigned a peer review partner after you submit your draft
3. Review your partner's paper and submit the review to them and to Canvas (40 points)
4. (Optional) Have the writing center critique an outline or draft of your paper (10 extra credit points)
5. Submit your final assignment (150 points)

A separate handout with more detail on the writing assignment will be posted.

TurnItIn

You will submit a draft and a final version of the writing assignments to Canvas' TurnItIn plagiarism prevention service. TurnItIn is a plagiarism prevention service.

Your assignment content will be checked for potential plagiarism against Internet sources, academic journal articles, and the papers of other OSU students, for common or borrowed content. Turnitin generates a report that highlights any potentially unoriginal text in your paper. The report may be submitted directly to your instructor or your instructor may elect to have you submit initial drafts through Turnitin, and you will receive the report allowing you the opportunity to make adjustments and ensure that all source material has been properly cited. Papers you submit through Turnitin for this or any class will be added to the OSU Turnitin database and may be checked against other OSU paper submissions. You will retain all rights to your written work. For further information, visit [Academic Integrity for Students: Turnitin – What is it?](#)

Letter Grade

Earning at least the total number of points specified below will earn you the corresponding grade.

Grade	Points Earned
A	930
A-	900
B+	870
B	830
B-	800
C+	770
C	730
C-	700
D+	670
D	630
D-	600
F	<600

Your instructor may curve grades upwards if a given assessment ends up being too hard, but will never curve grades downwards. You are not in competition with one another.

Course Content

The class week begins on Monday and ends Sunday evening.

Week	Topic	Assignments
Unit One: Evolution and Functional Morphology Exams open on Friday of the week offered and close the following Monday.		
1	Course Introduction An Introduction to Fishes Understanding Phylogenies Interpreting and Using Phylogenies	Week 1 readings Week 1 discussions Phylogeny interactive Introductory Questionnaire
2	Fins and Form Locomotion Skin, Scales and Teeth Muscles and Bones	Week 2 readings Week 2 discussions Skull Coloring Worksheet
3	Fish Skulls Skull Function Predation Defense	Week 3 readings Week 3 discussions Midterm Exam 1

Week	Topic	Assignments
End of Material for Midterm 1		
Unit Two: Physiology and Homeostasis		
4	Respiration Buoyancy	Week 4 readings Week 4 discussion Create a Fish Concept Statement
5	Homeostasis 1: Thermoregulation Homeostasis 2: Osmoregulation Digestion and Excretion Special Habitats	Week 5 readings Week 5 discussions
6	Nervous System Sensory Biology Bioluminescence and the Deep Communication	Week 6 readings Week 6 discussions Midterm 2
End of Material for Midterm 2		
Unit Three: Reproduction and Life History		
7	Reproductive Anatomy Reproductive Theory Reproduction: Case Studies	Week 7 readings Week 7 discussions Create a Fish Draft
8	Larval Development and Morphology Larval Habitat and Transport Age and Growth Aging Methods	Week 8 readings Week 8 discussions Midterm 3
End of Material for Midterm 3		
Unit Four: Ecology and Conservation		
9	Migration Diadromy Stocks, Populations and Species	Week 9 readings Week 9 discussions Create a Fish Peer Review
10	Species Interactions Communities and Ecosystems Conservation 1 Conservation 2 The Past, Present and Future of Ichthyology	Week 10 readings Week 10 discussions Create a Fish Final Version Submit comments from writing center (Optional)

Week	Topic	Assignments
Finals	Comprehensive Exam	Final Exam Due Wednesday by 11:59 pm

All other assignments are due the Sunday of the week in which they are listed at 11:59 pm. Unless otherwise noted, Exams open on Friday of the week they are listed and are due the following Monday at 11:59 pm. Discussions require at a minimum (= a grade of B) an initial topic post on Wednesday at 11:59 pm and a second topic and at least on peer response posts by Sunday by 11:59 pm. Any changes in these due dates will be posted in Canvas.

Course Policies

About Fish Names and Vocabulary

There are a lot of names and scientific terms that will be novel to many of you, and you are responsible for learning these as we go. Though this is not a full course on fish systematics, you do need to understand the composition of major groups of fishes (e.g. Teleostei, Chondrichthyes) as covered in lectures, the phylogeny diagram, and the phylogeny interactive. You do not need to memorize fish names at the level of family, genus and species. Fish names (common or scientific) if relevant will usually be in the question on exams, and you are always permitted to use the phylogeny handout during quizzes and exams.

Discussion Participation

Students are expected to participate in all graded discussions. While there is great flexibility in online courses, this is not a self-paced course. Late initial discussion board posts will be marked down by 5% for every day (24 hour period or portion thereof) that they are late after until the discussion board officially closes.

Make Ups

Make-up quizzes, midterms or exams will be given only in cases of excused absences (e.g. health-related absences or family emergencies) that are arranged in advance. Excused absences will not be given for airline reservations or routine illnesses. Excused absences will not be granted after the absence has occurred.

Regrades

Regrades of exams will be performed when there is an error and the student requests a regrade. *All requests for regrading must be made within one week of the day the exam or assignment is returned.* After that period of time, grades will be fixed and will not be changed.

Incompletes

Incompletes will be granted on a case-by-case basis and only in extreme circumstances in which there is a documented legitimate (e.g., health-related or family emergency) excuse for not being able to take the final exam. You must have completed at least 70% of the course (e.g., everything but the final) in order to request an incomplete. If you think that you will need to request an

incomplete, please contact your instructor with the details of your case as soon as possible. No incompletes will be granted post-hoc after the final exam has occurred.

Late Work Policy

Late writing assignments will be marked down by 5% for every day (24 hour period or portion thereof) that they are late up to ten days maximum. Please note that the final version of the Create A Fish writing assignment (due Sunday of week ten) will not be accepted after Wednesday of finals week under any circumstances. Late initial discussion board posts will be marked down by 5% for every day (24 hour period or portion thereof) that they are late until the discussion board officially closes. *No late contributions to the discussion boards will be accepted past the official Sunday due date under any circumstances.*

Communication

Please post all course-related questions in the Q&A Discussion Forum so that the whole class may benefit from our conversation. Please contact me privately using the Canvas inbox (left sidebar) for matters of a personal nature.

- Remember that online discussions are public messages, and all writings in this area will be viewable by the entire class. If you have a personal matter to discuss and prefer that only the instructor sees your communication, send it by email, and be sure to identify yourself and the class.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).
- All your online communications need to be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your level of professionalism.
- Please check the Announcements area and the course syllabus before you ask general course "housekeeping" questions (i.e. how do I submit assignment 3?). If you don't see your answer there, then please contact the instructor via the Q&A Discussion forum.
- We will try to respond to all course related emails sent during the work week within 24 hours. Response times may be longer over the weekend; believe it or not, we don't always work on Saturday and Sunday! If more than 48 hours elapses and you have not received a response, please feel free to send us a gentle reminder.
- We aim to have all work graded within five days of submission, with the exception of the final writing assignment, which may take two weeks to grade and return. If I need to deviate from this schedule, I will inform the class.

Guidelines for a Productive and Effective Online Classroom

Students are expected to conduct themselves in the course (e.g., on discussion boards, email) in compliance with the university's regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

Active interaction with peers and your instructor is essential to success in this online course, paying particular attention to the following:

- Unless indicated otherwise, please complete the readings and view other instructional materials for each week before participating in the discussion board.
- Read your posts carefully before submitting them.
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

Ecampus Reach Out for Success

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about [resources that assist with wellness and academic success](#).

Ecampus students are always encouraged to discuss issues that impact your academic success with the [Ecampus Success Team](#). Email ecampus.success@oregonstate.edu to identify strategies and resources that can support you in your educational goals.

For mental health:

Learn about [counseling and psychological resources for Ecampus students](#). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

For financial hardship:

Any student whose academic performance is impacted due to financial stress or the inability to afford groceries, housing, and other necessities for any reason is urged to contact the Director of Care for support (studentassistance@oregonstate.edu or 541-737-8748).

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval, please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Accessibility of Course Materials

All materials used in this course are accessible. If you require accommodations please contact [Disability Access Services \(DAS\)](#).

Additionally, Canvas, the learning management system through which this course is offered, provides a [vendor statement](#) certifying how the platform is accessible to students with disabilities.

Expectations for Student Conduct

Student conduct is governed by the university's policies, as explained in the [Student Conduct Code](#). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

Academic Integrity

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Student Conduct and Community Standards](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

- a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.
- b) It includes:
 - i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.
 - ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.
 - iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).
 - iv) TAMPERING - altering or interfering with evaluation instruments or documents.
 - v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another

person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

- c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

At a minimum, academic misconduct will result in a grade of zero for the assignment or exam, and may result in failure of the course.

Tutoring and Writing Assistance

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing suite where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Canvas class by clicking on the Tools button in your course menu.

The Oregon State [Online Writing Suite](#) is also available for students enrolled in Ecampus courses.

Student Evaluation of Courses

The online Student Evaluation of Teaching system opens to students during the week before finals and closes the Monday following the end of finals. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the online learning experience for future students. Responses are anonymous (unless a student chooses to “sign” their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.

Acknowledgments

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Course Design: Brian Sidlauskas, Ph.D.