

Syllabus: FAS 6932, Biology of Fishes Fall 2020

Instructor: Dr. Will Patterson, Fisheries and Aquatic Sciences, School of Forest Resources and Conservation; Email: will.patterson@ufl.edu; Office Phone: 352-273-3647

Teaching Assistant: None

Credits: 3 hours

Class Meeting Days and Times: Weekly online lectures and assignments

Prerequisites: Graduate student in good standing

Course Description: This 3-hour on-line graduate course is a survey of the diversity of fishes, including their anatomy, taxonomy, ecology, and conservation. Evolutionary trends are stressed, along with biogeography and biodiversity hotspots. The last section of the course is focused on fish ecology and conservation. Webinar-based discussions will occur biweekly, with two topical papers being the focus of student-led discussions. Weekly quizzes will be based on course readings and online lectures. Three exams also will be given during the semester, and students will write a review paper on the evolution, taxonomy, morphology, ecology, and conservation of a fish family prevalent in Florida waters.

Course Objectives: Upon completion of this course, you will be able to

- accurately employ biological terminology related to fish biology;
- reproduce the phylogenetic tree of fishes and describe evolutionary trends among different groups.
- detail novel morphological designs and when they first appeared in fishes and higher vertebrate groups;
- detail the various organ systems of fishes and higher vertebrates and their functions;
- describe the various aspects of the ecology of fishes, including the diversity in their life history strategies, feeding ecologies, and habitats utilized;
- and, understand conservation issues facing fishes and the potential policy solutions to conserving biodiversity among them.

Email Communication: All email correspondence to Dr. Patterson must be from your ufl.edu account, have your full name in the body of the email, and contain your course and section number in the subject line. Emails not meeting these requirements may not be recognized by our email filters, and thus may not be answered. If you email Dr. Patterson through the Canvas app, your UF information will be conveyed.

Required Textbook: Helfman G.S. et al. (2003) *The Diversity of Fishes: Biology, Evolution, and Ecology*, 2nd Edition. Wiley-Blackwell, New York, 720 pp. ISBN-13: 978-1405124942, ISBN-10: 9781405124942

Course Requirements: Course requires students to read assigned text readings, view recorded

lectures, read assigned papers from the primary scientific literature, participation in online discussions, complete weekly quizzes, write fish family review paper, and complete three online exams. Dates and times for biweekly paper discussions will be set once the semester starts.

Course Reading and Lecture Schedule:

Week	Date	Lectures	Helfman Reading	Paper Discussion
1	Aug 31	Intro to Biology of Fishes Intro to the Diversity of Fishes	Ch. 1: The science of ichthyology	
2	Sep 7	External Anatomy, Skeleton, Musculature Swimming Modes and Types	Ch. 3: Skeleton, skin, & scales Ch. 8a: Locomotion	A. Webb (1984) B. Shadwick (2005)
3	Sep 14	Respiration and Circulation Thermoregulation and Buoyancy	Ch. 5: O ₂ , metabolism, & energetics Ch. 7: Homeostasis	
4	Sep 21	Osmoregulation and Sensory Systems I Sensory Systems II	Ch. 7: Homeostasis Ch. 6: Sensory Systems	A. Baker et al. (2013) B. Kotrschal et al. (1998)
5	Sep 28	Sensory Systems III Jaw Evolution and Feeding	Ch. 6: Sensory Systems Ch. 8b: Feeding	
6	Oct 5	Reproduction and Life History I Reproduction and Life History II	Ch. 9: Early life history Ch. 10: Life stages	A. Price et al. (2011) B. Berkeley et al. (2004)
7	Oct 12	Exam I: Monday, October 12 th Evolution and Systematics	Ch. 2: Systematic procedures	
8	Oct 19	Primitive fishes I Primitive fishes II	Ch. 11: A history of fishes Ch. 13: Primitive fishes	A. Amemiya et al. (2013) B. Bergman et al. (2016)
9	Oct 26	Chondrichthyes	Ch. 12: Chondrichthyes	
10	Nov 2	Teleosts I Teleosts II	Ch. 14: Teleosts at last I Ch. 15: Teleosts at last II	A. Briggs (2005) B. Santini et al. (2013)
11	Nov 9	Zoogeography Special habitats and adaptations	Ch. 16: Zoogeography Ch. 18: Special habitats and adaptations	
12	Nov 16	Exam II: Monday, November 16 th Fish as predators and prey	Ch. 19: Fish as predators Ch. 20: Fish as prey	
13	Nov 23	Feeding ecology and trophic position Communities and ecosystems	Ch. 25: Communities, ecosystems & the functional role of fishes	A. Tarnecki & Patterson (2015) B. Wernberg et al. (2016)
14	Nov 30	Population dynamics Fisheries	Graduate student paper due 12/4	
15	Dec 7	Conservation Invasive fishes	Ch. 26: Conservation	A. Worm et al. (2009) B. Dahl and Patterson (2014)
16	Dec 14	Exam III: Monday, December 14 th		

Lectures: Lectures will be posted on the Canvas site. Lecture format will be video files of powerpoint presentations presented by Dr. Patterson. In addition, weekly vocabulary and review questions will be posted on the courses Canvas site. Students should read the Helfman chapters assigned for a given week, watch lecture videos, and study vocabulary and review questions prior to taking a weekly timed (30 min) quiz, which will be open-note and administered in Canvas. Quiz

questions will be pulled from a question bank and randomized, so no two students will take the exact same quiz.

Weekly Quizzes: Quizzes will be available on the Canvas site. You will have access to each quiz for one week. Each quiz will be available from midnight on the Saturday and disappear on Friday at 11:59 p.m. of a given week. Once you open a quiz, you will have a maximum of 30 minutes to answer 10 questions. The questions will be randomly pulled from a bank of 50 questions for each week. Questions will be locked once answered, so there will be no opportunity to go back to previous questions. There will be no quizzes during exam weeks, thus a total of 12 quizzes will be given. The two lowest grades will be dropped, including zeros.

Paper Discussions: Students will be split into two sections for student-led paper discussions throughout the semester. Participation is mandatory and will constitute 10% of your final grade.

Exams: There will be three exams given during the course; see syllabus for dates. Exams will be available and proctored through an exam-taking app (HonorLock) that will be described in greater detail prior to first exam. Students will be required to have a web cam available to view while taking the exam; cameras integrated into laptops or tablets will suffice. Exam format will be 10 fill in the blank (1 pt each), 6 definitions (4 pts each), 4 short answer questions (8 pts each), and two long-answer questions (17 pts each). We will review the exam format prior to the first exam.

Paper Assignment: Each student will select a fish family of ecological or economic importance to Florida. Topics to be covered include the family's taxonomic diversity, evolutionary history and phylogeny, unique anatomical characters, predominant ecology (e.g., longevity, growth, reproductive mode, feeding ecology, life history strategy, etc.) among species in the group, human impacts, and conservation status. Your paper should be 8-10 pages, double-spaced, and 12-pt Times New Roman font. You may use subheadings between sections but otherwise leave no extra spacing between paragraphs.

Grading: Course grade will be based on weekly quizzes (20%), participation in paper discussions (10%), exam grades (20% each; 60% total), and paper assignment (10%). The grading scale is below; see current UF policies for assigning grade points: <http://gradcatalog.ufl.edu/index.php>.

Grading Scale:

Point Range (%)	Letter Grade	GPA Equivalent
≥93.0	A	4.00
90.0-92.9	A-	3.67
87.0-89.9	B+	3.33
83.0-86.9	B	3.00
80.0-82.9	B-	2.67
77.0-79.9	C+	2.33
73.0-76.9	C	2.00
70.0-72.9	C-	1.67
67.0-69.9	D+	1.33
60.0-66.9	D	1.00
60.0-62.9	D-	0.67
<60.0	F	0.00

Policies and Requirements

This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas.

Late Submissions & Make-up Requests

It is the responsibility of the student to access on-line lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues **MUST** be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You **MUST** e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392-HELP = 352- 392-4357 (option 2).

Communication Courtesy and Professionalism:

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. Respect for individual differences and alternative viewpoints will be maintained in this class at all times. All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students' Office.

Semester Evaluation Process:

Student assessment of instruction is an important part of efforts to improve teaching and learning. At approximately the mid-point of the semester, the School of Forest Resources & Conservation will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is not the UF Faculty Evaluation!

At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Academic Honesty Policy:

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 or 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/process/student-conduct-honor-code>.

Inclusive Learning Environment:

This course embraces the University of Florida's Non-Discrimination Policy, which reads, The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act. If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <http://multicultural.ufl.edu>.

Services for Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

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.

Campus Helping Resources

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- Learning-support@ufl.edu | (352) 392-HELP - select option 2 | <http://elearning.ufl.edu>
- Library Help Desk support <http://cms.uflib.ufl.edu/ask>
- SFRC Academic Hub <https://ufl.instructure.com/courses/303721>

Student Life, Wellness, and Counseling Help:

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness resources <http://www.counseling.ufl.edu/cwc/>

- U Matter, We Care <http://www.umatter.ufl.edu/>
- Career Connections Center <http://career.ufl.edu/>
- Other resources are available at <http://www.distance.ufl.edu/getting-help> for online students.

Student Complaint Process:

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered. If you have a more urgent concern, your first point of contact should be the SFRC Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- Students in online courses: <http://www.distance.ufl.edu/student-complaint-process>
- Students in face-to-face courses: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>