Fish Evolutionary Innovations Syllabus

Spring 2024

Thursday 3:00-4:50 PM

Eckart 127

There is," Darwin said, "a grandeur in this view of life," in which "endless forms most beautiful and most wonderful have been, and are being, evolved."

Welcome to the Seminar

Throughout this seminar, our focus will be on exploring impactful, recently published scientific papers within the field of Fish Evolutionary Biology. Each week, two students will choose and present two scientific papers. It's crucial for everyone to read the assigned papers beforehand and arrive at class equipped with questions, comments, or critiques for discussion. Our discussions will begin with 15-minute presentations by each student who selected the paper, totaling 30 minutes of presentations, using PowerPoint slides. The presentations will conclude with open questions, leading to a broader discussion involving the entire class. It's important to note that the papers chosen each week should ideally complement one another, fostering deeper insights into the subject matter.

Course Information

Course Description	This seminar delves into the remarkable adaptations and evolutionary milestones that have shaped the diversity and success of fishes in aquatic environments. We we will explore various key innovations in fish anatomy, physiology, behavior, and ecology, and analyze their significance in the evolutionary history of fishes. Beyond academia, this understanding is essential for informing conservation efforts and managing natural resources sustainably.
Credits	2 units
Instructor	Dahiana Arcila
Email	dkarcila@ucsd.edu

Course Learning Outcomes

After completing this course, you will have strengthened your abilities in reading, presenting, and critically assessing scientific papers, centering on the following goals:

1. Critically assess research literature
2. Synthesize and communicate findings
3. Deliver scientific research presentations
4. Participate in meaningful discussions regarding research topics
5. Identify different scientific journals, understand authorship roles, and grasp the key elements of scientific papers.

Course Materials and Tools

Each student is tasked with selecting a peer-reviewed primary research article to present to the class, with papers requiring approval from the instructor beforehand. We will focus on targeting high-impact publications that should not exceed 5 years old, preferably from distinguished journals such as Science, Nature, PNAS, Current Biology, among others. While publications from other journals are acceptable, presenters should justify the paper's high impact. Additionally, I will provide a list of potential topics for your consideration available in Canvas. Please select the topic and papers you will discuss by April 11th.

Text/Readings/Other Material

- Wainwright, PC., and S.J. Longo. 2017. Functional Innovations and the Conquest of the Oceans by Acanthomorph Fishes. Current Biology. 27, 11: R550-R557.
- Carey MA, Steiner KL, Petri WA Jr. 2020. **Ten simple rules for reading a scientific paper.** PLoS Comput Biol. 16(7):e1008032. doi: 10.1371/journal.pcbi.1008032. PMID: 32730251; PMCID: PMC7392212.
- O'Connor, S. & ChatGPT. 2023. **Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?** Nurse Educ. Pract. 66, 103537.
- Stokel-Walker, C. 2023. ChatGPT listed as author on research papers: many scientists disapprove. Nature News. 613: 620-621.
- Miller AH, Stroud JT, Losos JB. 2023. The ecology and evolution of key innovations. Trends Ecol Evol. 38(2):122-131. doi: 10.1016/j.tree.2022.09.005. Epub 2022 Oct 8. PMID: 36220711.

Summary of Grade Criteria

Grading will be conducted on a satisfactory/unsatisfactory (S/U) basis, emphasizing active participation, presentation quality, peer review, and final reflection. Students are expected to attend and engage actively during seminar sessions to achieve a satisfactory grade in participation. Presentations and paper discussions will be assessed based on clarity, organization, and relevance to the seminar theme, with feedback provided for improvement.

Course Schedule Spring 2024

Week	Spring 2024	Title / Topic	Activities, Assessments, and Due dates
1	April 4	• Introduction • Seminar structure • Paper presentation • Discussion	• Wainwright, PC., and S.J. Longo. 2017. Functional Innovations and the Conquest of the Oceans by Acanthomorph Fishes. Current Biology. 27, 11: R550-R557.
2	April 11	Visit Birch Aquarium	Wainwright, PC., and S.J. Longo. 2017. Functional Innovations and the Conquest of the Oceans by Acanthomorph Fishes. Current Biology. 27, 11: R550-R557.
3	April 18	Pending	Two PowerPoint presentations & papers discussions
4	April 25	Pending	Two PowerPoint presentations & papers discussions
5	May 2	Pending	Two PowerPoint presentations & papers discussions
6	May 9	Pending	Two PowerPoint presentations & papers discussions
7	May 16	Pending	Two PowerPoint presentations & papers discussions
8	May 23	Pending	Two PowerPoint presentations & papers discussions
9	May 30	Pending	Two PowerPoint presentations & papers discussions
10	June 6	Pending	A PowerPoint presentation, paper discussion & and visit to the Marine Vertebrate Collection