

Objectives: **Biology of Fishes** covers the systematics, evolution, structure, function and biology of fishes. Emphasis will be placed on recent developments in systematics and evolution. The laboratory will provide an overview of the morphological diversity of fishes.

Instructor: Phil Hastings; phastings@ucsd.edu
Office Hours: by appointment

Graduate Teaching Assistant: Ashley Nicoll; anicoll@ucsd.edu
Office hours: by appointment

Lecture: on-line, MWF, 11:00-11:50; recorded version & notes available on Canvas

Lab: on-line, Tuesday/Thursday, 2:00-4:30; recorded version & notes available on Canvas
Optional in-person demonstrations in Vaughan Hall 147;
Tentative dates: April 13, May 4, June 1 (subject to change)

Books & Readings

Required:

Hastings, P.A., H.J. Walker & G.R. Galland. 2014. *Fishes: A Guide To Their Diversity*. University of California Press. 311 pp. (e-book available at UC Press; <http://www.ucpress.edu/book.php?isbn=9780520283534>)

Helfman, G.S., B.B. Collette, D.E. Facey & B.W. Bowan. 2009. *The Diversity of Fishes. Biology, Evolution, and Ecology*. Blackwell Science, Ltd, Oxford. (2nd Edition)

Recommended for Regional Marine Fishes:

Kells, V.A., Rocha, L.A. & Allen, L.G. 2016. *A Field Guide to Coastal Fishes: From Alaska to California*. Johns Hopkins Press.

Love, M.S & Passarelli, J.K. 2020. *Miller and Lea's Guide to the Coastal Marine Fishes of California*, 2nd Edition. UCANR Publications.

Additional Readings: posted on Canvas course website

Grading: Optional as Pass/Fail or Letter Grade

SIO 188: Letter grades will be roughly based on a percentage of 400 points
(A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; E = < 60%)
Lab notebooks, quizzes & assignments (e.g., paper summaries) = 200 points
Lecture exams (mid-term & final): 2 x 100 = 200 points

SIO 294: Letter grades will be based on above plus a research paper (100 points) on a topic of interest to you (500 points total. Details to follow.

SIO 188/294 Biology of Fishes, Spring 2021, Lecture schedule (tentative)

Readings are from Helfman et al. 2009, *The Diversity of Fishes*

Other readings will be assigned as required

- Week 1. Diversity; Phylogenetic biology & classifications; Anatomy (Chap 3-4)
 - Week 2. Early evolution of fishes (Chap 1-2); Agnathans; Gnathostomata (Chap 11)
 - Week 3. Chondrichthys; Biology of chondrichthyans (Chap 12)
 - Week 4. Sarcopterygii; Actinopterygii; evolutionary trends (Chap 13)
 - Week 5. Swimming (Chap 8, pp. 111-119); Sensory Systems (Chap 6)
 - Week 6. Feeding (Chap 8, pp. 119-126; Chap 19); Respiration (Chap 5, pp. 57-64)
 - Week 7. Reproduction (Chap 21)
 - Week 8. Biogeography (Chap 16, pp. 329-338); Speciation (Chap 17)
 - Week 9. Habitats (Chap 18)
 - Week 10. Radiations (Chap 15, pp. 308-312; Chap 17, pp. 381-387)
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SIO 188/294 Biology of Fishes, Spring 2021, Lab schedule (Tentative)

Groups are covered in Hastings et al. 2014, *Fishes: A Guide to Their Diversity*

- Week 1. Major groups of fishes; External & internal anatomy of fishes
 - Week 2. Osteology of Bony fishes
 - Week 3. Agnatha – Jawless fishes
 - Chondrichthyes – Cartilaginous fishes
 - Week 4. Osteichthyes – Bony fishes; Sarcopterygii – Lobe-finned fishes;
 - Actinopterygii 1 – Ray-finned fishes: Polypteriformes to Ostariophysi
 - Week 5. Actinopterygii 2 – Ray-finned fishes: Argentiniformes to Beryciformes
 - Week 6. Actinopterygii 3 – Ray-finned fishes: Mugiliformes to Scorpaeniformes
 - Week 7. Actinopterygii 4 – Ray-finned fishes: Perciformes to Carangiformes
 - Week 8. Actinopterygii 5 – Ray-finned fishes: Labriformes to Scombriformes
 - Week 9. Actinopterygii 6 – Ray-finned fishes: Stromateiformes to Tetraodontiformes
 - Week 10. Convergence; Local fishes
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