

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 hands-on experience with the morphological diversity of fishes.

Instructor: Phil Hastings; phastings@ucsd.edu
Office Hours: by appointment (Vaughan Hall 201; 822-2913)

Graduate Teaching Assistant: Zach Skelton; zskelton@ucsd.edu
Office hours: Thursday, 11:00-12:00 (Vaughan Hall 230)

Class Meetings: Lecture & Lab: Tuesday/Thursday, 2:00-5:50 (Vaughan Hall 147)

R/V Sproul Cruise: Full day Saturday or Sunday cruise (tentative: date to be determined)

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. Copies at UCSD textbook center; 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:

Kells, V.A., Rocha, L.A. & Allen, L.G. 2016. *A Field Guide to Coastal Fishes: From Alaska to California*. Johns Hopkins Press.
Miller, D.J. & R.N. Lea. 1972. *Guide to the coastal marine fishes of California*. Calif. Fish Bull. 157:1-249.

Additional Readings: posted on TritonEd (TED) website

Important Dates (subject to change)

Lab Exam 1	2/6
Lecture Exam 1	2/13
Lab Exam 2	3/15
Research paper due	3/16
Final (Lecture Exam 2)	3/20 (Tuesday), 3:00-6:00 pm

Grading: Letter grades are roughly based on a percentage of 800 points

Lab exams: 2 x 150 = 300 points

Lab notebooks & assignments = 100 points

Lecture exams: 2 x 150 = 300 points

Research paper: 100 points

A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; E = < 60%

SIO 294 Biology of Fishes, Winter 2018, 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. Lecture EXAM 1. 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)

SIO 294 Biology of Fishes, Winter 2018, Lab schedule

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

Week 1. Major groups of fishes; External anatomy of fishes; Osteology

Week 2. Osteology (continued); Internal anatomy of fishes

Agnatha – jawless fishes

Week 3. Osteology (continued)

Chondrichthyes – cartilaginous fishes

Week 4. Osteichthyes – Bony fishes; Sarcopterygii – Lobe-finned fishes;

Actinopterygii 1 – Ray-finned fishes: Polypteriformes to Ostariophysii

Week 5. **Lab exam 1**

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. **Lab exam 2**

Convergence; Local fishes
