

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

**Class Meetings:** Lecture & Lab: Tuesday/Thursday, 1:00-4:50 (Vaughan Hall 243)

**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>)

**Recommended:**

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. (2<sup>nd</sup> Edition)  
Miller, D.J. & R.N. Lea. 1972. *Guide to the coastal marine fishes of California*. Calif. Fish Bull. 157:1-249.

**Additional books on reserve in SIO Graduate Department**

Moyle, P.B. & J.J. Cech. 2008. *Fishes: An Introduction to Ichthyology*. Prentice Hall.  
Nelson, J.S. 2006. *Fishes of the world* (4th edition). J. Wiley & Sons, New York.

**Additional Readings:** posted on TED website

**Project/Paper.** Each student is expected to write a short paper (12-15 pages double spaced) on some aspect of fish biology or evolution that includes an up-to-date Literature Cited section. This could be a literature review on a question of particular interest or original research. Students should discuss their selected topic with the instructor by the middle of the quarter.

**Important Dates (subject to change)**

Lab Exam 1	4/28
Lecture Exam 1	5/5
Paper due	5/28
Lab Exam 2	6/4
Final (Lecture Exam 2)	6/8 (Monday), 3:00-6:00 pm

**Grading:** Letter grades are roughly based on a percentage of 700 points

Lab Exams: 2 x 150 = 300 points

Lecture exams: 2 x 150 = 300 points

Project/paper = 100 points

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

(S/U grading option is available with instructor's consent)

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**SIO 294 Biology of Fishes, Spring 2015, Lecture schedule (tentative)**

Week 1. Diversity; Phylogenetic biology & classifications; Early evolution of fishes

Week 2. Agnathans; Gnathostomata; Osteology & internal anatomy

Week 3. Chondrichthys; Biology of chondrichthyans

Week 4. Sarcopterygii; Actinopterygii - evolutionary trends

Week 5. Swimming; Sensory Systems

Week 6. Lecture EXAM 1. Feeding; Respiration

Week 7. Reproduction

Week 8. Biogeography; Speciation

Week 9. Habitats

Week 10. Radiations; Adaptations

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**SIO 294 Biology of Fishes, Spring 2015, Lab schedule (tentative)**

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

Week 2. Osteology (continued)

    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 Ostariophysi

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

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