Biology of Fishes (SIO 294), Winter 2016 **Course Description**

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. (2nd 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 (10-12 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	2/2
Lecture Exam 1	2/9
Paper due	3/8
Lab Exam 2	3/10
Final (Lecture Exam 2)	3/15 (Tuesday), 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)

SIO 294 Biology of Fishes, Winter 2016, 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

SIO 294 Biology of Fishes, Winter 2016, 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
