Objective: 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


Recommended:

Additional Readings: posted on TritonEd (TED) website

Important Dates (subject to change)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Lab Exam 1</td>
<td>2/5</td>
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<tr>
<td>Lecture Exam 1</td>
<td>2/12</td>
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<tr>
<td>Lab Exam 2</td>
<td>3/14</td>
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<tr>
<td>Final (Lecture Exam 2)</td>
<td>3/19 (Tuesday), 3:00-6:00 pm</td>
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Grading: Letter grades are roughly based on a percentage of 700 points

<table>
<thead>
<tr>
<th>Grade</th>
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<tr>
<td>A</td>
<td>90-100%</td>
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<td>B</td>
<td>80-89%</td>
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<td>C</td>
<td>70-79%</td>
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<td>D</td>
<td>60-69%</td>
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<td>E</td>
<td>&lt; 60%</td>
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**SIO 188 Biology of Fishes, Winter 2019, 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. Chondrichthyes; 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 188 Biology of Fishes, Winter 2019, 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 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