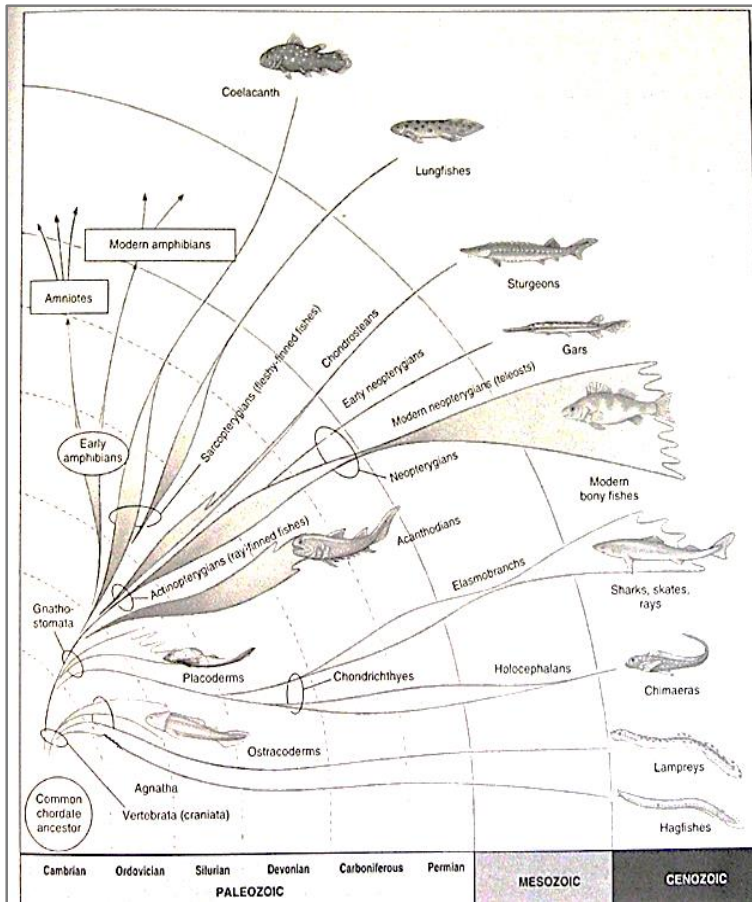


# **BIOLOGY 335 (20384) Jan 2024**

## **ICHTHYOLOGY -Biology of Fishes**

- **Lecturer: Dr. T. E. Reimchen (reimchen@uvic.ca)**
- **Lecture: 0830-0920, Tues, Wed, Fri**
- **Laboratory Co-ordinator Dr. Rossi M. Marx (zoology@uvic.ca)**
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- **Outline of Lecture Topics**
- **General morphology and anatomy of fishes**
- **Taxonomic diversity, life history and habitat - hagfish to halibut**
- **Swimming hydrodynamics - propulsion, drag, boundary layer, fin function**
- **Physiology - buoyancy, osmoregulation, O<sub>2</sub> uptake**
- **Sensory modes - chemoreception, mechanoreceptors, electroreception, vision, nociception, perception**
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- **Behavioral ecology - reproduction, foraging, parasitism**
- **Natural selection and adaptation: Haida Gwaii stickleback, coral reef fishes**
- **Fisheries science –principles, establishing quotas, MSY, applications**
- **BC and global trends in fish abundance, major causes for declines**
- **Conservation: Law of the Sea, FAO Code of Conduct, no-take zones, marine protected areas, rockfish conservation zones**
- **Emerging issues: ocean chemistry, soundscape, invasive species in FW**
- **Summary**

## Biology 335- Lab Schedule- Spring 2024



### Lab Mark Breakdown

Your lab mark is 45% of your final course grade and is divided as follows:

Component	Mark
<b>Lab Participation</b> You will participate in lab exercises and will receive marks for doing so. Your TA will outline what is expected during lab.	14%
<b>Midterm Exercises / Identification Exam:</b> Fish identification + questions	14%
<b>Final Exercises / Identification Exam:</b> Fish identification + questions	17%
<b>Total</b>	45%

Week	Date	Content
1	January 18	<ul style="list-style-type: none"> <li>&gt; Exercise: Fish anatomy and measurements</li> <li>&gt; Identification 1: Agnathans, Placoderms, and Chondrichthyes</li> <li>&gt; Ecological Techniques 1</li> </ul>
2	January 25	<ul style="list-style-type: none"> <li>&gt; Exercise: Fish functional anatomy / Measurement bias, part 1</li> <li>&gt; Identification 2: Osteichthyes (Sarcopterygii, Sturgeons to Herrings)</li> <li>&gt; Ecological Techniques 1 Discussion</li> </ul>
3	February 1	<ul style="list-style-type: none"> <li>&gt; Exercise: Measurement bias, part 2</li> <li>&gt; Identification 3: <b>Ostariophysi:</b> Minnows to Catfishes</li> <li>&gt; Ecological Techniques 2</li> </ul>
4	February 8	> Identification 4: Salmon to Trout-Perches
5	February 15	<b>Lab Midterm Exercise / Identification Exam</b>
6	February 22	READING BREAK – NO LABS
7	February 29	<ul style="list-style-type: none"> <li>&gt; Exercise: Hydrodynamics</li> <li>&gt; Identification 5: Flying fish, Sticklebacks, Rockfish, Sculpins</li> <li>&gt; Ecological Techniques 3</li> </ul>
8	March 07	<ul style="list-style-type: none"> <li>&gt; Identification 6: <ul style="list-style-type: none"> <li>• <b>Scorpaeniformes</b> (continued): Poachers to Snailfishes</li> <li>• <b>Perciformes:</b> Black Sea Bass to Pricklebacks</li> </ul> </li> <li>&gt; Ecological Techniques 4</li> </ul>
9	March 14	<ul style="list-style-type: none"> <li>&gt; Identification 7: <ul style="list-style-type: none"> <li>• <b>Perciformes (continued):</b> Pholidae (Gunnels) to Channidae (<i>e.g.</i> Northern Snakehead)</li> <li>• <b>Pleuronectiformes:</b> Pleuronectidae (<i>e.g.</i> Soles) to Paralichthyidae (Sanddabs)</li> <li>• <b>Tetraodoniformes:</b> Balistidae (Triggerfishes) to Molidae (Sunfishes)</li> </ul> </li> </ul>
10	March 21	<ul style="list-style-type: none"> <li>&gt; Exercise: FishSounds Lab - Bioacoustics in Marine Research</li> <li>&gt; Identification Review</li> </ul>
11	March 28	<b>Lab Final Exercise / Identification Exam</b>
12	April 4	Exam viewing

- **Course reading material: (in Reserve Reading Room, McPherson Library)**
- **Moyle and Cech, 2004. Fishes: An introduction to Ichthyology**
- **Helfman, Collette and Facey, 1997, The diversity of fishes**
- **A textbook is not required for the course but students particularly interested in fishes may opt to purchase a secondhand copy of an Ichthyology text on E-Bay, etc**

- **Thought-provoking reading:**

- **C. Roberts- 2007. The Unnatural History of the Sea**
- **R. Ellis 2003 -The Empty Ocean:**
- **C. Safina 1998 -Song for the Blue Ocean**
- **M. Harris 1998- Lament for an Ocean**
- **A. Mitchell 2009 - Sea Sick**
- **Suggested viewing: Blue Planet2 , Planet Earth, Seaspiracy, Sharkwater, etc**



- **MARKS**
- **Lecture Midterm Quiz (Fri, Feb 16) (short answers) 25%**
- **Lecture Final Exam (TBA) (multi-choice, short answers, essay) 30%**
- **Laboratory 45%**

**Students not wanting their marks posted using ID# (last 5 digits) should notify me at the beginning of the term. It is the student's responsibility to meet the ADD/DROP dates from the UVic calendar. Students are responsible for checking their own records and registration status and should review the UVic student code of conduct . Deferred exams will be offered only for medical issues. A supplementary exam is not permitted for those who get less than 50% in the course. Students receiving less than 50% on the cumulative laboratory mark receive a failing grade for the course.**

**All lectures, labs and exams are in-person (unless medical issues deem otherwise). Lecture material (and video) will be posted on Bright Spaces by 1700hrs the same day. Audio is not of consistent quality on the lecture videos so lecture attendance is encouraged.**

# Intended learning outcomes

- On completion of the course, students should be able to discuss each topic listed in the course outline including:
  - 1: the geological history and evolution of fishes
  - 2: hydrodynamics processes influencing form and function of fishes
  - 3: physiology, sensory and behavioral biology of fishes
  - 4: role of natural selection in structuring genetic variation within and among species
  - 5: principles and applications of Fishery science -successes and failures
  - 6: international treaties including the Law of the Sea and the Code of Conduct for Responsible Fisheries
  - 7: conservation of fishes (IUCN categories, no-take zones, MPAs)
  - 8: Laboratory content- acquire quantitative skills for the study of fishes and identify representative species from most groups of marine and freshwater fishes with particular attention to BC