

# BI 451 INVERTEBRATE ZOOLOGY

UNIVERSITY OF OREGON, OREGON INSTITUTE OF MARINE BIOLOGY, SUMMER 2020  
8 CREDIT HOURS

Note: this is the undergraduate only version of the course. All students taking this for graduate credit should refer to the syllabus for **BI 551**.

**LECTURES:** posted weekly on Canvas under “files.” You can log onto Canvas at [HTTPS://CANVAS.UOREGON.EDU/](https://CANVAS.UOREGON.EDU/) using your UO username and password. For guidance using Canvas see

[HTTPS://SERVICE.UOREGON.EDU/TDCLIENT/2030/PORTAL/KB/ARTICLEDET?ID=86662](https://SERVICE.UOREGON.EDU/TDCLIENT/2030/PORTAL/KB/ARTICLEDET?ID=86662)

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**OFFICE HOURS:** Online meetings available by appointment.

**COURSE MATERIAL ACCESS:** Course materials will be posted on Canvas

**COURSE COMMUNICATIONS:** Most lectures and practical instructions will be pre-recorded and available on Canvas. Quizzes and exams will be administered on Canvas and assignments will be posted on Canvas, although they can also be emailed to the instructor directly. Zoom® will be used for direct interactions between the instructors and students, but scheduling and frequency will depend upon course needs and student participation. All other interactions between students and instructor will be via email ([pkbaker@ufl.edu](mailto:pkbaker@ufl.edu)) or via the Canvas message board, which also links to my email, unless otherwise requested on an individual basis. *Note: some websites misspell my email address; be sure to include the k.*

**REQUIRED TEXT: none**

There is no required textbook. All textbooks contain useful information, but they also become dated by the time they reach the market, and they are expensive. The following texts and laboratory manuals are suggestions only, although they are strongly recommended if you intend to stay in a field related to invertebrate zoology. Additional texts or manuscripts for specific topics will be noted during the course.

## Suggested Texts (not required)

- Brusca, R.C., W. Moore, & S.M. Schuster (2016) *Invertebrates*, 3<sup>rd</sup> ed. Sinauer Associates, Sunderland, MA. 1104 pp. ISBN-10: 1605353752.
- Carlton, J.T. (ed.) (2007) *The Light and Smith Manual: Intertidal Invertebrates from Central California to Oregon*, 4<sup>th</sup> ed. Univ. California Press, Berkeley, CA. 1019 pp. ISBN-10: 0520239393.
- Kozloff, E.N. (1983). *Seashore Life of the Northern Pacific Coast: An Illustrated Guide to Northern California, Oregon, Washington, and British Columbia*. Univ. Washington Press, Seattle, WA. 378 pp. ISBN-10: 0295960841.
- Lamb, A. & B. Hanby (2005) *Marine Life of the Pacific Northwest: A Photographic Encyclopedia of Invertebrates, Seaweeds And Selected Fishes*. Harbour Publ., Pender Harbour, British Columbia. 398 pp. ISBN-10: 1550173618
- Nybakken, J.W. (1995) *Diversity of the Invertebrates: A Laboratory Manual. Pacific Coast Version*. McGraw Hill, Boston, MA. 328 pp. ISBN-10: 0697151204.
- Pechenik, J.A. (2014) *Biology of the Invertebrates*, 8<sup>th</sup> ed. McGraw Hill, Boston, MA. 606 pp. ISBN-10: 0073524182.
- Ruppert, E.E., R.S. Fox, & R.D. Barnes (2003) *Invertebrate Zoology*, 7<sup>th</sup> ed. Brooks-Cole, Belmont, CA. 989 pp. ISBN-10: 0030259827.
- Wallace, R.L. & W.K. Taylor (2002) *Invertebrate Zoology Lab Manual*, 6<sup>th</sup> ed. Benjamin Cummings, San Francisco, CA. 356 pp. ISBN10: 0130429376.

**ADDITIONAL INVERTEBRATE BIOLOGY RESOURCES:**

Wikipedia is a useful source of information for some invertebrates, but should never be used as a reference. You may use Wikipedia to find original references, but Google Scholar (<http://scholar.google.com/>) and PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>) are examples of more comprehensive databases of scientific and technical literature.

Taxonomy is a rapidly advancing field and even online resources such as Wikipedia may not represent the latest revisions. The most reliable taxonomic resource for marine invertebrates is probably the World Registry of Marine Species (WoRMS, <http://www.marinespecies.org/>). There is no comparable resource for the majority of freshwater invertebrates, although these

are increasingly covered by WoRMS. My favorite resource for terrestrial arthropods is BugGuide (<https://bugguide.net>).

**COURSE DESCRIPTION:**

Invertebrate animals (e.g. mollusks, crustaceans, echinoderms) comprise at least 97% of described species. Many are important in fisheries or aquaculture, while others are the foundations of major ecosystems. Invertebrates are more anatomically and biologically diverse than fish or other invertebrates, and this diversity must be understood in order to study their management. This course will examine the biology invertebrates, especially but not exclusively marine species. Topics will include taxonomy, morphology, distribution, habitat requirements, nutrition, major predators and parasites, significant ecological interactions, and life cycles. The course will be organized by taxonomic groupings, or phyla.

**INSTRUCTIONAL METHODS:**

**Lectures** - The lecture material, in the form of narrated Power Point presentations, will be prepared in advance and will not be live. They will be posted each week on Canvas, prior to Wednesday for the topics listed in the course schedule below for that week. There are four formats, each with their advantages and limitations, as follow:

1. Stream the presentation online at the website above as an MP4 video. This is simple and the audio file plays continuously, but the Internet links do not work, and you cannot easily click back and forth through the presentation.
2. Download the color .pdf file – In this version, the Internet links work, but not the audio.
3. Download the printable .pdf file – This is a smaller download, but there are no audio files or Internet links. Many students write notes on this.
4. Download the .ppt file – The original PowerPoint files are very large downloads, and require you to have a recent version of PowerPoint, but everything works the way I designed it, or the way I would present it in a live lecture.

You may go through the presentations at your pace.

**Quizzes** - Each week (starting with the second) that there is not a larger exam, there will be a timed quiz on material just from the prior week's material. You may use your notes, the presentations, or any other resources to answer the questions, but there will be only twenty minutes allowed for the entire quiz, which is insufficient time to look up the answers if you have not studied. Quizzes will be posted in Canvas prior to Wednesday of the week they are due, are closed midnight on the following Sunday, and will be worth ten points each. There is no make-up if you miss the deadline, except by prior arrangement.

**Exams** - There will be two exams: a midterm exam midway through the course, and a final exam at the end of the course. The midterm will cover the material from the preceding weeks, and the final exam will be comprehensive. As with the quizzes, you may use any materials to answer the questions, but the exams will be timed (2 minutes per point on the exam) and there will be no make-up without prior arrangement. The questions will include both short-answer and longer questions. You will also be asked to submit electronic images of sketches for the midterm and final exams, which can be uploaded in any of several ways. If you do not have a way to upload an image, you must make prior arrangements for an alternative.

**Invertebrate Drawings** – You will be required to do four invertebrate studies, each with at least two drawings. Additional information and instruction will be provided during the course. All are due as electronically transmitted images by 5:00 pm on Friday, August 7 (the end of the 7<sup>th</sup> week) but, if you turn any or all in by 5:00 pm July 24 (the end of the 5<sup>th</sup> week) you will be given feedback and an opportunity to improve the drawings.

**Reports** - One species report will be required, due by 5:00 pm on Friday, August 7 (the end of the 7<sup>th</sup> week). The topic, however, must be submitted to the instructor by 5:00 pm July 24 (and preferably much sooner), for approval. Late reports will be accepted at the instructor's discretion, but will suffer a penalty proportional to the lateness. More information on reports is provided separately in **Writing Assignments Guidelines for BI 451 Invertebrate Zoology**, available separately on Canvas, including a list of species omitted as possible topics.

The instructor is very tired of grading cephalopod reports. Please pick one of the other million+ possible species.

#### **COURSE TECHNOLOGY:**

Quizzes and exams are administered online in Canvas.

#### **COURSE POLICIES**

See assignment details (at **Writing Assignments Guidelines for BI 451 Invertebrate Zoology**) for more information not covered here.

**LATE POLICY:** Any late submissions due to technical (i.e. Internet, website, or computer technology) issues must be accompanied by the ticket number received from the UO Tech Service Desk (<https://service.uoregon.edu/TDClient/2030/Portal/KB/ArticleDet?ID=31704>) when the problem was reported to them. The ticket number will document the time and date of the problem. You must e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration for late submissions.

**GRADING:**

The course grade will be broken down as follows.

Quizzes	20% of grade
Midterm Exam	25% of grade
Final Exam	30% of grade
Drawings	12.5% of grade
Final Report	12.5% of grade

Grades are based on the cumulative of the percentages above; there is no curve. The grade cut-off values are as follow:

93% and above = A
90% = A-
88% = B+
83% = B
80% = B-
78% = C+
73% = C
70% = C-
68% = D+
63% = D
60% = D-

**COURSE SCHEDULE****Proposed Schedule of Topics.**

Each week will include 3-5 recorded lectures (PowerPoint presentations). The topic schedule listed below is an approximate guideline and actual times will be modified as needed, but all of the topics listed below will be covered. The final report is due by 5:00 pm on Friday, August 7.

Week 1 (June 22-26): <u>Sponges, Cnidarians</u>	(no quiz)
Week 2 (June 29-July 2): <u>Cnidarians, Various Worms</u> <i>July 3 will be reserved for observation of Independence Day</i>	<b>Week 1 Quiz</b>
Week 3 (July 5-9): <u>Annelids and Lophophorates</u>	<b>Week 2 Quiz</b>
Week 4 (June 3-7): <u>Mollusks</u>	<b>Week 3 Quiz</b>

Week 5 (June 10-14): Mollusks

**Midterm Exam**

Week 6 (June 17-21): Nematodes and Arthropods

**Week 5 Quiz**

Week 7 (July 1-5): Crustaceans

**Week 6 Quiz**

Week 8 (July 8-12): Echinoderms and Chordates

**Final Exam**

**Academic Integrity:** Please refer to the University of Oregon website:

<http://uodos.uoregon.edu/StudentConductandCommunityStandards/StudentConductCode/tabid/69/Default.aspx>