

University of Victoria
Fall 2024

BIOLOGY 321
SURVEY OF INVERTEBRATES

COURSE LOGISTICS

Instructor:

Dr. Benjamin Neal

Email benjaminpneal@uvic.ca

Office hours: Online (Zoom) Thursday 9:30-10:20 on this link:

<https://uvic.zoom.us/j/86856422298>

Senior Lab Instructor:

Connor Nelson

Email: connorjnelson@uvic.ca

Lecture meetings:

Tuesday, Wednesday, and Friday: 9:30 pm - 10:20 pm

Room: Bob Wright Center (BWC) A104

Laboratory Teaching Assistants and lab information:

Lab TA contact information for specific sections will be provided in the first lab period.

Textbooks and supplies (All available @ UVic Bookstore):

Required: BIOL 321 Lab Manual – 2024.

Recommended: Pechenik, J.A. Biology of the Invertebrates, 7th edition.

Optional: Dissecting kit *Some dissection tools will be available in labs for student use.

Prerequisites for BIOL 321:

BIOL 184, 186, 225

I acknowledge and respect the ləkʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

COURSE CONTENT:

Learning goals: The ‘invertebrates’ represent 90% or more of all species of multicellular animals. The organisms belonging to this informal grouping are not defined by the possession of any unique characteristic, but only by what they lack – an internal skeleton (of cartilage or bone) protecting a brain and dorsal nerve cord. Biology 321 will primarily focus on whole organisms and will be organized by phyla. It will deal with major elements of body plans, functional morphology, behaviour, physiology, reproduction & development, life cycles, evolution, and phylogeny of invertebrates. Given the vast number of invertebrate species, this is potentially a huge quantity of material, so I will whittle it down to a manageable amount by being highly selective about what I choose to include for each phylum, omitting many smaller phyla altogether and largely focusing on marine taxa. The biology of invertebrates is rich in fascinating material. My hope is to introduce you to the wonderful world of invertebrates and to encourage enthusiasm for the study of these animals and their ingenious adaptations and splendid diversity. I hope you will find the focus on structure and biology of invertebrates enriches, extends, and enlightens your understanding of life at other levels of biological organization - molecular, cellular, ecological.

Terminology: You will need to learn a number of terms for structures, concepts, and taxa. I will try to keep this manageable by asking you to learn only terms that are really essential for communicating about the biology of each group of invertebrates that we’ll study. Exactly what terms and definitions will you be expected to know?

- Terms for anatomical parts and concepts (with definitions) that are discussed during lecture (including labels on drawings and any text within the PowerPoint slides)
- Terms given in bold font in ‘Required Readings’ sections from your textbook
- Names of example organism taxa (note that taxonomic level varies)

For many smaller groups, it will be sufficient to only know the name of the phylum and a general description. For large groups you may be asked to learn additional taxonomic categories below the phylum level. These sub-phyletic taxon names will be identified during lecture and lab.

Lecture recordings and review material: The in-class lectures in BIOL 321 will be recorded when possible. If recorded, the recordings will be uploaded to Brightspace as “Class Lecture Recordings” in “Lecture Material”. The video platform for the lecture recordings will be Echo360; and you can click on the video link for each individual lecture (listed under Class Lecture Recordings) to view the recorded lectures. Recordings of lectures are not guaranteed but will be provided when possible. The accompanying PowerPoint slides from each lecture will also be presented as PDF files, on Brightspace.

Laboratory: The laboratory sessions in BIOL 321 are designed to provide students with the opportunity for hands-on examination of selected invertebrates. Lab activities will include:

1. observations of external and internal anatomy of organisms representing major invertebrate taxa, occasionally involving dissections
2. comparative observations to illustrate diversity within major taxa, and
3. observations of animal behaviour to inform about how morphology serves function.

Labs begin the week of September 9, 2024. There are a total of nine laboratory exercises; one per week except for Reading Week and the weeks for the midterm and final lab exams. If you are unable to attend the first lab for which you are registered, please contact Megan Davies, Senior Lab Instructor, before the day of the lab.

COURSE ASSESSMENT:

Assessment of Learning for overall course: Distribution of final grades will be based on the following rubric:

Lecture total	55%
Lecture Midterm #1, on paper, in class	20%
Lecture Midterm #2, on paper, in class	20%
Final exam, scheduled, online	15%
Lab total	45%
Laboratory Midterm Exam	10%
Final Laboratory Exam	15%
In-lab checkmarks	5%
Animal Research Project	15% (part 1: 5%, Part 2: 10%)

Policy on Missed Exams: Exams will be in-person, on paper, in the lecture or lab spaces, and there will be no scheduled makeup exams. Please contact the instructor as soon as possible to discuss any need for waived exams. Note that exam waivers are given only in cases of illness or mental health or compelling personal family issues, and not for scheduling, athletics, or other elective travel issues. The University of Victoria has waived the requirement for a medical note if illness or mental health issues prevent writing an exam. Only one waived exam will be granted per student per term; if student needs exceed one waived exam an incomplete grade for the term can be requested from the department.

Grade assessment when one or more assignments or exams are missed:

If a student is granted a waiver by the instructor for any of the lecture midterm exams or the midterm or lab final exam, the student's final grade percentage will be calculated based on all completed course work, without penalty. If two or more of the course items are not able to be completed, alternative exams may be possible, as per discretion of the instructor, but are not guaranteed.

Incompletes: If a student is unable to complete coursework and cannot achieve any rescheduled work before final grades are submitted for the course, they must immediately submit a formal request for concession using a Request for Academic Concession form (<https://www.uvic.ca/registrar/assets/docs/record-forms/rac.pdf>). If this process is not followed any missed coursework will be assigned a grade of zero. If the concession is granted, arrangements will be made to complete coursework at a later time, and a grade of N (incomplete)

will be assigned until the coursework is completed and the final grade calculated, at which time the N grade will be changed to the calculated grade.

Assessment of Laboratory Learning:

1) Midterm and Final Lab Exams: The midterm lab exam will be held during the week of Oct 7 2025 and is worth 10% of your final grade. It will cover material in Labs #1 – 4. The final lab exam will be held during the week of Nov 25, 2024 and will be worth 15% of your final grade. It will cover material in Labs #5 – 9.

2) Animal Research Project: This lab assignment will provide students with the opportunity for personal discovery about a particular invertebrate. Each student will study the anatomy and behaviour of a chosen invertebrate living in the ocean, freshwater, or terrestrial habitat.

Part I of the Animal Research Project is due at 9:00AM on October 21, 2024. Part II is due at 9:00AM November 18, 2024. For more information about the Animal Research Project see the “Biology 321 Invertebrate Biology Laboratory Manual (Fall 2024)” or the “Lab Assignments” module on the BIOL 321 Brightspace page.

4) Late lab assignments: Late submission of the Animal Research Project or any other lab assignments will be accepted for up to 48 after the assignment due date without penalty and without question. **After 48 hours, assignments will not be accepted and will be given a grade of zero. No exceptions or extensions**, except in cases of a prolonged debilitation during the term or a serious personal issue shortly before the submission deadline. Please refer to the policies in the lab manual and contact Megan Davies directly for any concession requests.

Covid-19 and In-person Classes: Although course instruction at UVic during Fall 2024 will be in-person within classrooms, we are still potentially subject to Covid-19 pandemic outbreaks and we should all take precautions to keep everyone safe. Students attending in-person classes and labs are not required to wear masks, but are welcome to do so if desired, and are requested to not attend in-person classes if they have any active symptoms at all or a recent positive test.

Course Grade and Academic Transcript: Grades for all UVic courses are submitted as percentiles. Academic transcripts will include the percentile grade and a letter grade. Percentiles will be rounded to the nearest whole number (up or down). Percentile grades will be converted to letter grades on the student’s academic transcript according to the table given below.

A+ 90 – 100%; A 85 – 89%; A- 80 – 84%; B+ 77 – 79%; B 73 – 76%; B- 70 – 72%; C+ 65 – 69%; C 60 – 64%; D 50 – 59%; F (Fail) is a grade less than 50%. For more information see: <https://www.uvic.ca/calendar/future/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=14%20-%20Grading&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies>

Schedule:

Lecture exams will be held in the regular class periods. For the complete lecture schedule please consult the online course schedule. Note that the instructor reserves the right to change the individual lecture schedule as needed in order to respond to unforeseen events like illness (i.e.

COVID), weather days, or other compelling circumstances. These times are rare, but please keep an eye on the online schedule and not on any printed schedule in case of this eventuality.

Lecture exam dates are noted below. These dates are fixed and makeups will not be allowed, except in extreme situations or unavoidable academic conflict (typically only at-sea labs).

Lecture content schedule (see note above about seeing online schedule for exact details)

Week 0: (First partial week, no lab, first lecture Wed. Sep. 4): Introduction to Invertebrates

Week 1: (Lab #1); Phylum Porifera

Week 2: (Lab #2); Phylum Cnidaria

Week 3: (Lab #3); Lophotrochozoa I: Phylum Platyhelminthes Phylum Rotifera

Week 4: (Lab #4); Lophotrochozoa II: Phylum Annelida Phylum Nemertea

Week 5: Midterm lab exams; lecture schedule will make up any missed content and move on to the next section as appropriate.

Week 6: (Note: corresponds to Lab #5): Lophotrochozoa III: Phylum Mollusca (Pt.1):
Polyplacophora and Gastropoda

Week 7: (Note: Animal Research Projects for Labs due this week); Begin Lophotrochozoa IV:
Phylum Mollusca (Pt.2): Bivalvia, Scaphopoda, Cephalopoda, and Phylum Bryozoa

Week 8: (Note: corresponds to Lab #6); Finish Lophotrochozoa: make up any missed lectures

Week 9: (Note; corresponds to Lab #7); Ecdysozoa I; Phyla Nematoda, Onychophora, Arthropoda

Week 10: (Note; corresponds to Lab #8); Ecdysozoa II; Phylum Arthropoda, Subphyla
Mandibulata and Pancrustacea

Week 11: Reading break

Week 12: Begin Deuterostoma: Phylum Echinodermata: Class Crinoidea, Asteroidea, Ophiuroidea

Week 13: Finish Deuterostoma: Phylum Echinodermata: Class Echinoidea, & Holothuroidea,
Phylum Chordata, Subphylum Urochordata

Last class Wednesday 4 December 2024.

Lecture Exam dates

Lecture Midterm Exam #1

Friday 4 October

Lecture Midterm Exam #2

Friday 8 November

Final Exam (Online)

Date TBD (in standard exam period)