

University of Victoria
Fall 2025

BIOLOGY 321
SURVEY OF INVERTEBRATES

COURSE LOGISTICS

Instructor:

Dr. Benjamin Neal. Email
benjaminpneal@uvic.ca

Office hours:

Online (Zoom) Thursday 9:30-10:30 on this link:
<https://uvic.zoom.us/j/86856422298>
In-person, on-campus meetings possible with prior communication, at the same hour.

Senior Lab Instructor:

Colin MacLeod
Email: cdmacleod@uvic.ca

Lecture meetings:

Tuesday, Wednesday, and Friday: 9:30 pm - 10:20 pm
First class Wednesday 3 September. Last class Wednesday 3 December.
Room: David Turpin Building (DTB) A102

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 – 2025. Available at the Bookstore.
Required: 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 the terms that are really most 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 used in any labs or in the Lab Manual
- Names of organism taxa, and their relationships (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 to provide review materials. If recorded, the recordings will be uploaded to Brightspace and clearly identified 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 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. These two document types will provide the lecture review material for this course.

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 8th. There are a total of nine laboratory exercises; usually 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 Connor Nelson, Senior Lab Instructor, before the day of your 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 (remote)	15%
 Lab total	 45%
Laboratory pop quizzes	10%
Final Laboratory Exam	15%
In-lab checkmarks	5%
Animal Research Project	15% (part 1: 5%, Part 2: 10%)

Policy on Missed Exams: Exams (except for the online final exam) will be in-person, on paper, in the lecture or lab spaces, and there will be no scheduled makeup exam time. Please contact the instructor as soon as possible to discuss any need for waived exams. Note that exam waivers are given primarily in cases of illness or mental health or compelling personal family issues, and not for scheduling conflicts 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, but email contact with the professor is required as soon as practical. Only one waived exam will be granted per student per term; if student needs exceed one waived exam an N grade for the term will be automatically assigned.

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 only on all completed course work, in other words, without penalty for that waived exam. If two or more of the course items are not able to be completed, please contact the instructor as soon as possible, and some student-specific accommodation may be possible as per discretion of the instructor, but such accommodations are not guaranteed.

Academic Concession: 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

all missed coursework will be assigned a grade of zero. If the academic concession is granted, arrangements will be made to complete coursework at a later time, and a grade of N 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. An "N" grade is assigned when a student fails to complete essential course requirements, and is recorded on the transcript as a 0.0 GPA. The maximum percentage that may be recorded alongside an N is 49%, even if a student completed some work in the course.

Assessment of Laboratory Learning:

1) Midterm Quizzes and Final Lab Exams: The lab pop-quizzes will occur during the labs, and will collectively be worth 10% of your final grade. The final lab exam will be held during the week of Nov 24th and will be worth 15% of your final grade. It will cover all material from Labs #1 – 9. You must have an overall passing grade in the lab portion of the course to take the final. If you do not have a passing grade in the lab portion, you will not be allowed to take the final lecture exam, and will not receive a passing grade for the course.

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 20th. Part II is due at 9:00AM November 17th, 2025. For more information about the Animal Research Project see the Biology 321 Invertebrate Biology Laboratory Manual or 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 24 hours after the assignment due date without penalty and without question. **After 24 hours, assignments will not be accepted and will be given a grade of zero. No further exceptions or extensions will be granted,** except in cases of a prolonged debilitation during the term or a serious personal issue which has been discussed before the submission deadline. Please contact the Senior Lab Instructor directly for any concession requests.

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>

Health precautions: Although course instruction at UVic is all currently in-person within classrooms and we are not subject to Covid-19 restrictions, we should still 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 all are requested to not attend in-person classes if they have any active symptoms at all or a recent positive COVID test.

Schedule:

Lecture exams will be held in the regular class periods. For the complete lecture schedule please consult the online course schedule (link on Brightspace). Note that the instructor reserves the right to change the individual lecture schedule as needed in order to respond to unforeseen events like illness such as COVID, institutional weather closures, or other compelling circumstances. These times are rare, but please monitor the live online schedule and not a pre-printed schedule in case of this eventuality.

All lecture exam dates are noted on the online schedule. These dates are fixed, will not be changed, and makeups are only allowed in pre-approved situations (as discussed above) or unavoidable academic conflict (typically applies only at-sea labs or other fixed direct time conflicts).

Academic integrity:

Academic integrity is built on honesty and fairness. Students, faculty and staff at UVic are all members of an intellectual community, and as such, it's expected that we'll adhere to ethical values in all our learning, teaching and research. You are responsible for academic work that you submit or work on with others. This means not cheating, plagiarizing, falsifying materials, using an unauthorized editor or acting in other academically dishonest ways.

Academic dishonesty includes, but is not limited to:

- Using AI programs to generate text for submissions
- Manipulating laboratory processes or data in order to achieve desired results
- Using work prepared in whole or in part by someone else and submitting it as your own
- Citing a source from which material was not obtained
- Presenting a reference from a non-original source as a reference to the original source.
- Submitting false records, information or data in writing or orally
- Copying the answers or other work of another person
- Having any materials or equipment in an exam or test other than those authorized
- Accessing or attempting to access examinations or tests before permitted
- Helping others to engage in any of the conduct described above

If you are found guilty of violating the academic integrity policy, the penalty assigned varies by circumstance. Penalties may include:

- Being called to discuss the issue with the instructor
- A reduced grade for the assignment
- A failing grade for the whole course
- Disciplinary probation, a notation on your transcript, or suspension