

COURSE OUTLINE			
TERM: Spring 2027		COURSE NO: BIOL 212	
INSTRUCTOR:		COURSE TITLE: INVERTEBRATE ZOOLOGY	
OFFICE	LOCAL:	SECTION NO(S):	CREDITS: 4.0
E-MAIL:	@capilanou.ca		
OFFICE HOURS:			

Capilano University is named after Chief Joe Capilano (1854–1910), an important leader of the Skwxwú7mesh (Squamish) Nation of the Coast Salish Peoples. We respectfully acknowledge that our campuses are located on the unceded territories of the səlilwətał (Tseil-Waututh), shíshálh (Sechelt), Skwxwú7mesh (Squamish), and xʷməθkʷəy̓əm (Musqueam) Nations.

COURSE FORMAT

Each week there are three hours of lab, three hours of class time, and a 3-day field trip for a 15-week semester, which includes two weeks for final exams.

COURSE PREREQUISITES

BIOL 109 (C-) or BIOL 110 (C-); and BIOL 111 (C-)

CALENDAR DESCRIPTION

This course is a comparative survey of the major phyla and classes of invertebrates with emphasis on phylogeny, adaptive biology and ecology of each group. The course is designed around the major unifying concept of evolution. It introduces issues of contemporary interest in the field of invertebrate zoology. The laboratory complements the lecture components.

COURSE NOTES

BIOL 212 is an approved Science and Technology course for Cap Core requirements.

BIOL 212 is an approved Science course.

BIOL 212 is an approved Lab Science course.

This course may include a multi-day field trip to the Bamfield Marine Station spanning a weekend.

REQUIRED TEXTS AND/OR RESOURCES

Textbook:

Custom Text from Hickman, Jr. C.P., S. Keen and A. Larson and D. Eisenhour and H. I'Anson and L. Roberts. (2018) *Integrated Principles of Zoology*. (17th ed.) New York, NY: McGraw-Hill.

Lab Manual:

Custom Lab Manual from Hickman, Jr. C.P., L. S. Roberts, A. Larson, and H. I'anson. (2018) *Laboratory Studies in Integrated Principles of Zoology*. (17th ed.) New York, NY: McGraw-Hill.

Optional Books:

Cannings, R., S. Cannings and M. de Jong Westman. (2009). *Life in the Pacific Ocean*. Vancouver: Greystone.

Van de Graff, K.M. and J.L. Crawley. (2005). *A Photographic Atlas for the Zoology Laboratory*. Englewood, CO.: Morton Publishing Company.

COURSE STUDENT LEARNING OUTCOMES

On successful completion of this course, students will be able to do the following:

Lecture:

- Discuss the major distinguishing characteristics of each phylum of invertebrate organisms.
- Trace the evolutionary pathways between and within phyla as far as it is known.
- Describe the adaptations of members of the various phyla to different modes of existence.

Laboratory:

- Through direct observation, be aware of the general structure of representatives of each major phylum and be aware of the amount of variation within each phylum.
- Relate observed key characteristics of representatives of each group to evolutionary trends and adaptations to life in specific environments.
- Classify observed specimens and be able to rationalize the assignment.

Field Trip:

- Identify the major marine invertebrate forms of the Bamfield area of Vancouver Island and to carry out studies in intertidal ecology (tide and date dependent).

Students who complete this Science and Technology course will be able to do the following:

- Assess the impacts of human activity on natural systems and articulate ways in which environmental sustainability may be achieved.
- Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
- Explain how scientific inquiry is based on investigation of evidence and evolves based on new findings.
- Participate in scientific inquiry and communicate the elements of the process, including making careful and systematic observations, developing and testing a hypothesis, analyzing evidence, and interpreting results.

COURSE CONTENT

Topics for detailed discussion will be:

Subject	Details
Introduction	Evolution of the Invertebrates Invertebrate Phylogeny Evidence for Evolution

Subject	Details
<i>Discussion of each major phylum will include:</i> • <i>diversity of the phylum</i> • <i>identifying characteristics</i> • <i>structural and functional adaptations</i> • <i>the phylum's contribution to the story of invertebrate evolution</i>	
Introduction to Metazoans	Organization Embryogeny
Poriferans	Sponges
Cnidarians	Hydroids, jelly fishes, sea anemones, and their relatives
Ctenophores	Comb jellies and sea gooseberries
Platyhelminthes	Flatworms
Nemertean	Ribbon worms
Pseudocoelomates	Nematodes, rotifers, and their relatives
Molluscs	Snails, clams, octopuses, and their relatives
Annelids	Earthworms, leeches, and their relatives
Arthropods	General characteristics
Arthropods	Basis of success
Arthropods	Overview of key classes
Onychophora	Velvet worms and their relatives
Lophophorates	Bryozoans, brachiopods, and their relatives
Echinoderms	Sea stars, sea urchins, and their relatives
Hemichordates	Acorn worms and their relatives
Urochordates and Cephalochordates	Sea squirts, lancelets, and their relatives

EVALUATION PROFILE

Final grades for the course will be computed based on the following schedule:

Term Work (Laboratory and Lecture Quizzes, Midterm & Assignments)	*70%
Comprehensive Final Exam	30%
TOTAL	100%

*No single test or assignment will be worth more than 35%.

A graded assessment will be returned to students prior to the withdrawal date.

In order to pass the course, students must receive at least 50% on both the lecture and laboratory portions of the course.

Specific dates and details regarding the Evaluation Component will be provided by the instructor.

GRADING PROFILE

A+ = 90-100	B+ = 77-79	C+ = 67-69	D = 50-59
A = 85-89	B = 73-76	C = 63-66	F = 0-49
A- = 80-84	B- = 70-72	C- = 60-62	

Incomplete Grades

Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

Late Assignments

Assignments are due at the beginning of the class on the due date listed. If you anticipate handing in an assignment late, please consult with your instructor beforehand.

Missed Exams/Quizzes/Labs etc.

Make-up work is given at the discretion of the instructor. Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In certain exceptional situations the student will be permitted to write a make-up test, defer the lab to a later date, or to replace the score by other marks (see below). The date and timing of any make-up option is at the discretion of the instructor. It may not be possible to reschedule certain labs, tests, or other activities.

A score of zero may be avoided when the student meets all of the following conditions:

1. Circumstances are beyond the control of the student which resulted in the exam, test, quiz, lab, etc. to be missed. Such circumstances include serious illness or injury or severe personal crises. They do not include forgetting about the test, lack of preparation for the test, or work-related or social obligations.
2. The student has notified the instructor (or the School of STEM office staff, if the instructor is not available) about the missed exam, test, quiz, lab, etc. Such notification must occur in advance or, at the latest, on the day of the exam, test, quiz, lab, etc.
3. Evidence of the circumstances may be requested. Proper medical documentation of illness or injury may be required from a doctor.
4. The student has been fully participating in the course up until the circumstances that prevented the writing of the exam, test, quiz, lab, etc. Fully participating means regularly attending labs and lectures and turning in assignments in the course.

Accommodations can be made to honor community needs and traditional practices.

Attendance

Students are expected to attend all classes and associated activities. If classes are missed, it is the student's responsibility to become aware of all information given in the lectures and laboratories, including times of examinations and assignment deadlines.

Attendance at laboratories is mandatory, and missed work will be assigned a zero grade. To pass the laboratory component of this course, you must achieve a minimum mark of 50% overall, and you must have attended and completed a required minimum of laboratory work. A student missing 3 lab sessions, for any reason, cannot pass the lab course. If you are feeling sick, please stay at home and do not attend the lab session. If absence from an in-person, in-lab session is unavoidable, contact your lab supervisor, preferably before the class, and certainly no more than one day after the missed lab. Regular attendance in lecture is essential. If classes are missed, it is the student's responsibility to become aware of all information given in the lectures, including times of examinations and assignment deadlines.

English Usage

Students are expected to use correct standard English in their written and oral assignments, exams, presentations, and discussions. Failure to do so may result in reduced grades in any part of the Evaluation Profile.

Electronic Devices

Students may use electronic devices during class for note-taking, calculations, and in-class research.

On-line Communication

Outside of the classroom, instructors will (if necessary) communicate with students using either their official Capilano University email or eLearn; please check both regularly. Official communication between Capilano University and students is delivered to students' Capilano University email addresses only.

UNIVERSITY OPERATIONAL DETAILS**Tools for Success**

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <https://www.capilanou.ca/student-services/>

Capilano University Security: download the [CapU Mobile Safety App](#)

Policy Statement (S2009-06)

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Academic Integrity, Academic Probation and other educational issues. These and other policies are available on the University website.

Academic Integrity (S2017-05)

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy and procedures S2017-05 Academic Integrity for more information:

<https://www.capilanou.ca/about-capu/governance/policies/>

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,

- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including B.401 Sexual Violence Policy and B.401.1 Sexual Violence Procedure (found on Policy page <https://www.capilanou.ca/about-capu/governance/policies/>)

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.

DEPARTMENT OR PROGRAM OPERATIONAL DETAILS

Professionalism

Students should be able to demonstrate a professional attitude and behaviour: reliability, respect for and cooperation with colleagues, willingness to work calmly and courteously, respect for equipment and systems, and constructive response to criticism. The use of cellphones for non-academic purposes during lecture and lab sessions is prohibited. Students using cell phones inappropriately could be asked to leave the lecture hall or laboratory room by the instructor.

Lab Exemption Policy for Students Repeating Course:

If a student repeating the course has received 65% or better for the laboratory component of the course within the past three terms, they may apply for exemption from the lab. Students must obtain an exemption form from the Biology Laboratory Convenor or from the Coordinator of Biology. The exemption form should be completed with appropriate signatures and returned to the Biology Laboratory Convenor within the first week of classes. If students are exempted, their previous lab mark will be carried over in calculating their final mark for the course in the current term.

Tools for Success

For success in this course, students are expected to attend all lectures and laboratory sessions; come prepared to address topics presented; pre-read laboratory exercises; and complete assigned text book readings. For every one hour of lecture material presented, students should expect to spend at least two hours reviewing material and engaging with the study tools provided.