

Applied Molecular Biology, Biol388, CRN: 10404, Fall 2025

University of Victoria

Welcome!

We acknowledge and respect the Lək̓ʷəŋən (Songhees and X̱wsepsəm/Esquimalt) Peoples on whose territory the university stands, and the Lək̓ʷəŋən and WSÁNEĆ Peoples whose historical relationships with the land continue to this day.

We are thankful to be able to learn together on this land, and strive to make the world a better place.

We welcome everyone to learn in this course and we respect every human being, including all people from all ethnic backgrounds, religious beliefs, sexual orientations, genders, socioeconomic backgrounds and abilities.

Your instructor

Instructor: **Dr. Barbara Ehltling** (Course coordinator, lecturer)

email: behltling@uvic.ca

Connect:

- via email. My goal is to respond no later than within 24 h on business days.
- in person. Just send me an email and we arrange a meeting time. Office hours are for you to connect with me, discuss lecture material, and for us to get to know each other.
- My background: You can find out more on Brightspace 'Meet your instructor' site!

Goals for this course:

I want you to engage in the transfer from basics to applications of molecular biology found in many areas of daily life. I will introduce you to the power of eDNA relevant in ecology, DNA analyses relevant for forensic investigations as well as paternity tests, genetic counselling and personalized ancestry, the importance of modern drug production. You will meet professionals from local companies, police officer working for the Coroners Service of BC and genetic counsellors working at Victoria General hospital (VGH) as well as scientists working for local companies. For major topics you will be engaged in case studies where you can apply your knowledge and solve queries.

My main goal is to excite you about the many applications in very (!) diverse disciplines and potentially develop your own ideas about future applications.

Intended Learning Outcomes for 'Applied Molecular Biology':

At the end of this course, you will...

- have an understanding how **molecular biology is applied** in four non-academic/applied areas: forensic Biology, genetic counselling, the power of eDNA used in ecology and biotechnology.
 - you will learn about **potential workplaces** and **applications** of molecular tools outside research, which hopefully opens doors for your future (directly and indirectly by considering the discussed topics but also thinking outside the box)
- engage with the lecture material by answering and submitting answers to **discussion questions** during class time (formative assessments, low stakes participation case studies)
 - You will draw conclusions from graphs/figures by applying learned material and finding solutions by discussing with peers.
- collaborate with peers working on large **case studies** (summative assessment, marked grades)
 - you will apply what you have learned, search for new information independently and solve cases collaboratively within your working group
- explore the field of applied molecular biology by **presenting one new (!) topic of your choice** to the class at the end of term
 - you will open the door to more topics of applied molecular biology and be comfortable to share your information with your peers
- **engage with professionals** (one police officer, genetic counsellor(s), one post-doc working with eDNA, scientist(s) working at local biotechnology companies, ...). Listen to their presentations and ask questions!
- perform to perfection **major life skills** such as *meeting deadlines, punctuality, time management, collegiality, open discussion* with peers and instructor, being *proactive* aiming for problem solving rather than complaining.

Designated Class time and location:

Mondays & Thursdays at 10 am – 11.20 am in DSB C126

Class time is our time together and critical for your active learning journey. I designed this course as an active learning experience with student engagement in form of discussion questions (participation grades), group work to work on case studies (graded work), student presentations, and open discussion. It is important that each one of us takes an active part in this class by active listening and asking questions.

Prerequisites:

Biol230

Tentative Class Schedule

- Welcoming, rules and regulations,
- Introduction to Applied molecular biology
- Topic 1: Forensic investigations: genetic fingerprint
- Topic 2: Genetic counselling, Personalized genomes and ancestry
- Topic 3: Application in ecology: environmental DNA (eDNA)
- Topic 4: Biotechnology, Production of hormones, amino acids in large scale
- Student presentations
- Wrap up and catch up, Review, evaluation...

Lecture Material:

- Textbooks: Different textbooks are used for different topics, but those are optional. All important information will be given on lecture notes.
- Lecture Notes: Lecture notes will be posted on Brightspace. I recommend that you bring the lecture notes to classes to add comments on slides and answer questions.

Provided course material (including lecture slides, case studies and exams) are made available for instructional purpose ONLY and are not allowed to be distributed without permission. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others through online note-sharing violates the Policy on Academic Integrity.

- Lecture Recordings: Lectures (and student presentations) will be recorded with Echo360 (video files) and/or voice (audio files).

Evaluation:

- **Small case studies** (Participation grades): 1% each for answering and submitting discussion topics during class (4-6 small case studies for the four topics, **20 % total**),. You can discuss with your peers, but every student submits their own work for participation grades.

- **Large case studies: 7% each** (one large case study for the four topics, **28 % total**), instructions given in class, might be completed outside class time, done in groups.

If you miss class, you can submit participation/small case studies and large case studies electronically on Brightspace within 24 and 48 h of class time, respectively. Late submission will be 0%.

If you are sick/have a valid reason for being unable to submit your work on time, please

contact the course coordinator (B. Ehlting) ASAP via email. Alternative forms of assessment might be necessary and would be discussed with the instructor. Working on cases studies (small and large) are considered essential core components of the class.

Missing too many small & large case studies will result in an N (minimum submission with substantial content of ten small case studies and two large case studies).

- **Presentation:** 8%, each student presents at the end of term a new, not yet discussed topic about applied molecular biology of their own interest (5 min as individual). Once you selected a topic, enter your topic in the sign-up sheet (see Brightspace -> assignment -> Sign-up sheet for End-of-Term Presentation). Make sure you're your topic has not been selected already. The presentation is considered an essential core component of the class.
- **Escape room** 4%, started on Nov 20 th, group submission. There is no deferred option for the escape room. If you miss the escape room for valid reason communicated to the course coordinator (B. Ehlting) via email, the final exam will be worth 44%.
- **Final exam:** 40%, cumulative, during final exam period

To pass this course, students must

- Submit a minimum of ten small case studies (out of 20)
- Submit a minimum of two large case studies (out of 4)
- Present a topic of their choice at the end of term
- Write the final exam

How to be successful

Understanding the details of molecular applications is so much fun! This course is a success when you learn, understand and be happy. Making mistakes is a good way to learn and is never a failure.

I strongly encourage you to **attend (!) lectures, listen, take (handwritten) notes and engage during discussion sessions with your peers**. I strongly encourage you to ask if you have questions! Class time is our time together for asking/answering question. It is very important to stay on top of class material and study for a few hours after each lecture. Write your own summaries, compare, and ask yourself 'what if' questions (e.g. What is the best method to identify individuals if the DNA is degraded?) Form **study groups** with your peers: 4-5 students is a good group size. Only once you can talk about the material you really understand it.

I want you to know that **off – task activities** like checking email, text messaging, checking social network sites, is **negatively affecting students' grades (your own and your peers next to you) by more than 10% (Sana et al. 2013, Computers and education 62, 24-31)**. I strongly recommend that you turn off your off – task aps/programs during class time and study time to allow you to focus and not be distracted by social media and other non-course related sites!

Important Dates

In the UVic calendar you will find a fuller list of important dates, but the ones we have listed below are the ones that will matter to students in Applied Molecular biology.

Sept 3rd 2025 First day of classes at UVic

Sept 4th: First lecture for Biol388 at 10 am

Sept 16th: Last day for 100% reduction of tuition fees

Sept 19th: Last day for adding courses that begin in the first term

Sept 30th: National Day for Truth and Reconciliation, UVic closed

Last day for paying first term fees without penalty

Oct 7th: Last day for 50% reduction of tuition fees for standard courses

Oct 13th: UVic closed (Thanksgiving), no lecture

Oct 27-31 10 am – 2 pm Drop by the 5 Day Hub at Petch Fountain (5 Days of action)

Oct 27 11.30 am – 12.50 pm Foundations to Equity, Diversity and Inclusion (5 Days of action)

1 – 2.20 pm Sexualized Violence Prevention Foundations Series Part 2: Let's talk about Consent (5 Days of action) (lecture will run as usual)

Oct 29 4.30 – 5.50 pm Sexualized Violence Prevention Foundation Series Part 3: Active Bystander Intervention (5 Days of action)

Oct 30 10 – 11.20 am Foundations to Equity, Diversity and Inclusion (5 Days of action)

Oct 31st: Last day for withdrawing from first term courses without penalty of failure

Nov 10-12th: Reading break, no classes

Nov 20th: Escape room, in class group project 4%

Nov 24th, 27th, and Dec 1st: **Student presentations**

Dec 3rd: Last day of classes at UVic

Dec 6-20th: Exam period

Stay healthy!

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. Mindfulness, meditation and yoga might help you to stay mentally healthy. Human societies have respected one day of rest in a seven day week over hundreds of years. I

believe that taking one day off per week is essential for your mental health and overall well-being. Therefore, I am respecting your weekends (no emails or deadlines on weekends).

Avoid last minute study panic by working regularly throughout the term: we recommend that you spend at **least 2-3 hours studying after each lecture!** This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle.

If you are not feeling well, stay at home. If you miss class, you will be able to catch up by watching the video recording of live classes on Brightspace.

If I as instructor have to stay home, I will deliver course content by pre-recorded lectures.

General regulations:

We cannot change your grade for any reason, except if we have made an error calculating it. There is no extra work that you can do to raise your grade.

Failure to complete essential components of this course (minimum 50% of small and large case studies, student presentation and final exam) will result in a grade of “N” regardless of the cumulative percentage on other elements of the course. N is a failing grade and factors into GPA as a value of 0.

Please read the appropriate section of the current UVic Academic Calendar regarding your rights and obligations.

<https://www.uvic.ca/calendar/future/undergrad/index.php#/policies?expanded=Undergraduate%20Academic%20Regulations>

You are expected to **observe UVic academic regulations and standards of scholarly integrity** especially with regards to plagiarism and cheating. Please check out this link: <https://www.uvic.ca/library/help/citation/plagiarism/>

UVic and we as instructors are committed to promoting, providing and protecting a supportive and safe learning and working environment for you and us.

I hope that you are enjoying a great term with Applied Molecular Biology!

UVic support centers:

Centre for Accessible Learning (CAL): promote educational accessibility for students with disabilities and chronic health conditions. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

<https://www.uvic.ca/accessible-learning/index.php>

Counselling Services - Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students. Due to covid19 service is now offered by phone

<https://www.uvic.ca/services/counselling/>

Computer help desk if you have any **technical issues** using Brightspace
(helpdesk@uvic.ca)

Elders' Voices - The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.

<https://www.uvic.ca/services/indigenous/students/programming/elders/index.php>

Health Services - University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives. UVic Health has transitioned to offering services almost entirely by telehealth

<http://www.uvic.ca/services/health/>

Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being. Supporting Indigenous students.

<https://www.uvic.ca/services/indigenous/>

Office of Student life: student conduct, first year experience, Student mental health, Sexualized violence awareness,... : <https://www.uvic.ca/services/studentlife/index.php>

Sexualized Violence Prevention and support: how to start conversations about consent, support on and off campus

<https://www.uvic.ca/sexualizedviolence/>

Student support services: the office of registrar helps with academic concession, fee reduction appeals, room bookings,... <https://www.uvic.ca/registrar/students/index.php>

Student Wellness Centre to support students' mental, physical and spiritual health by a team of counsellors, nurses, physicians, spiritual care providers.

<https://www.uvic.ca/student-wellness/index.php>

Support Connect: offers short term solution focused counselling, available 24/7 help by phone or online. Supported by counsellors, consultants and life coaches.

<https://www.uvic.ca/student-wellness/wellness-resources/supportconnect/index.php>

UVic Bounce: Stories about resilience and how we stand up again after falling.

<https://uvicbounce.ca/>