

Principles of Genetics – BIOL 230
University of Victoria, BC
Course Outline, Winter term 2024

I. Welcome to BIOL230!

We acknowledge and respect the lək̓ʷəŋən peoples on whose traditional territory the University of Victoria stands, and the Songhees, Esquimalt 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, socio-economic backgrounds and abilities.

II. Your Teaching Team:

- *Dr. Barbara Ehlting* (Course-coordinator and lecturer),

email: behlting@uvic.ca, Office Petch 005

Dr. B. Ehlting is the course coordinator, so if you have any lecture related issue, please feel free to contact BE.

- *Dr. Gregory Owens* (lecturer),

email: grego@uvic.ca , Office Cunningham 040

- *Kimberley Curry* (Senior Laboratory Instructor),

email: biologylabs@uvic.ca

K. Curry is the senior lab coordinator, so if you have any lab related issue, please feel free to contact KC.

How to connect with us?

- We are happy to connect with you over email, but we ask that you respect everyone's time.

Please check published course information (on Brightspace, the lab manual) first, before sending us questions that have already been answered.

- You can always connect via email. If you email us, please put 'Biol230' in the subject line.

- Please keep communication professional. Emails should begin with a proper greeting, use complete and real words in the body and end with your name and student ID. Sending a professional email is different than sending a text message to a friend.

- Want to meet in person? Just send us an email and we arrange a meeting time. Office hours are for you to connect with us, discuss lecture material, and for us to get to know each other.

- Want to know about our background? You can find out more on the Brightspace 'Meet your instructor' site!

III. Goals for this course:

We are a team of dedicated science teachers who love genetics. Our goal is to teach you complex cellular processes involving discoveries from over one hundred years ago (Mendelian genetics) or just last decade (Next gen sequencing). We will show you how genetics plays an important role in all our daily lives (genetically modified crops, forensic investigations, medical diagnostics)! We hope you enjoy “Principles of Genetics”, and we wish to provide you with a detailed and foundational understanding of genetics.

Intended Learning Outcomes:

-1. For the lecture

During this course, you will...

- learn how molecular processes such as cell division works.
- understand how cells access and use their genetic material.
- understand inheritance patterns of traits.
- understand what heritability is and how it is measured.
- learn traditional methods as well as modern techniques of molecular biology.
- see how genetic knowledge is used and applied and present in our daily lives.
- learn a variety of experimental approaches, sometimes more general and sometimes very specific examples.
- learn to read and interpret figures from peer reviewed scientific papers.
- engage with lecture material by discussing questions with your peers during lectures
- perform **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.

-2. For the laboratory

We have carefully selected lab activities for three purposes:

- 1) to provide a hands-on opportunity for you to grasp genetic theories through practice,
- 2) to provide opportunities to successively expand on your newly obtained laboratory skills, and
- 3) to become proficient in the use of computing tools used in genetic research labs.

Following a research project that includes an evaluation of current research of a gene of choice, you will be able to communicate your research through class presentation. You will correctly distinguish the components of precise and clear scientific communication through writing and presenting your research.

Upon completion of the lab, it is expected that you will be proficient at the use of several lab techniques and equipment.

Lab techniques –DNA extraction, polymerase chain reaction, gel electrophoresis, bioinformatic tools

Lab equipment – such as micropipettes, centrifuges, nano-spectrophotometers, electrophoresis equipment and UV gel imaging equipment

IV. Designated Class Time and Location

- Tue, Wed and Fri 10:30 – 11:20 am in BWC B150

- Classes start Jan 8th and end April 8th 2024.

Class time is our time together and critical for your active learning journey. We encourage you to take an active part in this class by active listening, asking questions and participating in discussion questions.

Flipped classroom plan

In the second half of the course, starting on February 27th, Dr. Owens will teach using a flipped classroom style. Lectures will be video recordings posted before class. You are expected to watch the video before (!) class time. During class time, you will work through problems and activities related to the video topic in groups or individually. This will also be an opportunity to ask questions and talk with Dr. Owens.

V. Pre-and Co-requisite:

Pre-requisite: BIOL225.

Pre- or Co-requisite: CHEM231.

Recommended: BIOC299.

VI. Tentative lectures schedule:

1. Welcoming, Introduction to the class
2. Cell cycle, and genetic significance of mitosis and meiosis (BE)
3. Transcription (BE)
4. Translation (BE)
5. Gene expression (BE)
6. Biotechnology: cloning, sequencing...(BE)
7. Genomics and proteomics (BE)
8. Inheritance and Genetic Mapping (GO)
9. Population genetics (GO)
10. Quantitative Genetics and Heritability (GO)
11. Evolutionary Genetics (GO)

VII. Textbook and Lecture slides:

- 'Genetics Analysis and Principles' by Robert J. Brooker, 7th (2021) edition, McGraw- Hill Ed.
- Lecture notes and pre-lecture videos will be posted on the course website Brightspace. It is recommended that you bring the lecture notes to classes to add comments on slides and answer questions.
- Lectures may be recorded with Echo360 (video files) and/or voice (audio files).

Provided course material (including lecture slides, pre-lecture videos 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.

VIII. General Laboratory Information

Welcome to the Genetics labs at the University of Victoria. This is the laboratory component of Biology 230 and is a requirement in completing the course. Each of the exercises outlined in the lab are to be completed at weekly intervals and are meant to introduce you to the laboratory protocols and techniques commonly used in genetic research labs around the world. I hope you will enjoy!

-Required Readings and Materials

The laboratory manual will be posted weekly on the laboratory Brightspace [website](https://bright.uvic.ca/d2l/home/307507) (<https://bright.uvic.ca/d2l/home/307507>). You are expected to read the lab manual and watch any supplementary videos posted on the course website prior to arriving to the lab.

-Lab safety

You are expected to wear closed-toe shoes, a lab coat, and lab safety glasses.

-Lab schedule

You must enrol in and attend a lab section in this course.

Labs will begin the week of Jan 15th in either Cunningham 102 or 116. Check your schedule to find out what lab you will be in.

-Lab Policies

Detailed lab policies are outlined on the lab Brightspace page. Here is a summary:

- Grade challenges** – you have one week to request a remark of lab work.

-Late assignments – are not accepted and there will be no deferrals for any missed lab work or summative assessments. See lab concession and accommodation procedures on the course website. Details and instructions for assignments will be discussed in lab and will be posted on our BRS site. *Assignments that are late will receive a mark of 0.0 (Please refer to UVic Policies and Procedures). *e.g.*, there are no extensions or late marks.

-Plagiarism – zero tolerance for plagiarism in any form. Any words or ideas that are not your own **MUST** be acknowledged. Plagiarism includes “recycling” work from other classes, and it includes copying from online sources, including artificial intelligence sources (*e.g.* ChatGPT)

IX. Evaluation:

The lecture component is worth 60%. The lab component is worth 40%.

1. Lecture component (60%):

Lecture evaluation (see details below) 60%:

- 10 Mini quizzes 8%
- one Midterm exam 20% on Friday Feb 16
- one Final exam 32%

- 10 **Mini Quizzes** (formative assessments): 1% each for a total of **8 %** (we only count the best 8 out of 10). **Every Friday** a **mini quiz** is posted on Brightspace and should be answered within 24 h. The first quiz will be on Friday Jan 12, 2024 and the last one on Friday April 5th, with one quiz every week, exceptions are the day of the midterm and during reading week and Good Friday (UVic closed). It is your responsibility to complete those participation quizzes. There is NO deferred option for mini quizzes.

- **Midterm exam** (summative assessment): **20%**, on Friday Feb 16 written online (on Brightspace) and timed during class time. The exam will have multiple choice and multi select questions from the lecture.

If you miss the midterm exam for valid reason (illness, accident, family crisis or athletic competition representing UVic), it is your responsibility to inform the course coordinator (BE) as soon as possible to be permitted to write the deferred midterm. The **deferred midterm** will be scheduled for Friday March 1st 2 pm – 3 pm online on Brightspace.

Students must write either the midterm exam or the deferred midterm exam to successfully complete this course. Not writing either the midterm exam or the deferred midterm exam will result in an N.

- **Final exam** (summative assessment): **32%**, cumulative, time determined by UVic during exam period in April.

- For **all online examinations**: Students are expected to bring their own mobile devices to write the exam. If you have no mobile device, you can borrow devices from the library. If you need further help please contact the course coordinator (BE) at the beginning of term and we will find a solution for you.

You can write the quizzes, midterm exam in the classroom or you can write at home. You are expected to **observe UVic academic regulations and standards of scholarly integrity** especially with regards to plagiarism and cheating. Exams that are written online, are open book exams: you are allowed to consult lecture notes and textbook, however budget your time carefully (there will NOT be enough time to look up the answers for every single question)! The exams must be taken **individually** and not with a friend/classmate or a group. You are prohibited from sharing any information about the exam with others or from capturing or recording (screen shots) exam questions. **Students are not allowed to use AI tools during the exam.**

-Lab Evaluation (see lab introduction for details) 40%

- Assignments 24%

- Presentation (course requirement) 6%, Week of Mar 25

- Lab Exam (course requirement) 10%, week of Mar 11

-Grade conversion:

A+ 90-100%; A 85-89.5%; A- 80-84.5%; B+ 77-79.5%; B 73-76.5%; B- 70-72.5%;

C+ 65-69.5%; C 60-64.5%; D 50-59.5%; F <49.5%

In determining final grades for the course, our spreadsheet will round your course score to the nearest whole percent. That is the official course grade that will be submitted for you.

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.

-To pass the course, students must:

- 1) Write one midterm exam
- 2) Write the final **lecture** exam
- 3) Meet the minimum **lab** attendance requirement (attend at least 7 of the 9 labs)
- 4) Complete the **lab My Gene** project presentation
- 5) Write the practical **lab** exam
- 6) Score a grade of 50% or greater, in the **Laboratory** component
- 7) Score a grade of 50% or greater, in the **Lecture** component.

If any of 1 through 5 are not completed, the student will automatically fail the course and receive an "N" ('Incomplete') on their transcript. An N is a failing grade, and it factors into a student's GPA as 0. The maximum percentage that can accompany an N on a student's transcript is 49. If a student successfully completes 1 through 5, but is not successful in either 6 or 7, they will receive an "F" on their transcript.

X. Universal design for learning (UDL) and 'How to be successful'

Success is when you are happy and you learn. It is better to be active in the learning activities (mini quizzes and class discussions) than not participating at all and tuning out. Making mistakes is not failure but a good way to learn!

We designed this class with the UDL in mind by

- clearly outlining the **intended learning outcomes** (ILO),
- **engaging students actively** during class time with mini quizzes and interactive lectures
- having all **class material accessible** to all students all the time (pre-lecture lecture slides, post-lecture recordings)
- evaluate students with a mixture of frequent low stakes **formative assessments** (mini quizzes) and a few higher stakes **summative assessments** (midterm, final, lab exam)

UVic is a professional environment. Please be mindful of your peers and the instructors. Please treat people around you with respect and courtesy, focus on active **listening and taking (hand written) notes**. Please avoid distracting behaviour like eating three-course meals, watching sports games, online shopping or texting during lecture time. **Off – task activities** like checking email, text messaging, checking social network sites, is **negatively affecting students' grades by more than 10% (Sana et al. 2013, Computers and education 62, 24-31)**. Therefore: **turn off your off – task apps/programs during class time and study time to allow you to focus and not be distracted!**

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. Human societies have respected one day of rest in a 7-day week over hundreds of years. Taking one day off per week seems essential for mental health and overall well-being. Therefore, we respect 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 1-2 hours studying after each lecture!** This will help you achieve your goals and cope with stress.

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

XI. 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 Principles of Genetics. Additional important lab dates can be found on the lab Brightspace [Calendar](#).

Tuesday Jan 9th: **First lecture** at 10.30 am
Monday Jan 15th: Labs begin
Sunday Jan 21st: Last day for 100% reduction of second term fees
Wednesday Jan 24th: Last day for adding courses that begin in second term,
Jan 31st: Last Day for paying second term fees without penalty
Sunday Feb 11th: Last day for 50% reduction of tuition fees
Friday Feb 16th: Lecture **Midterm exam**
Monday Feb 19th- Friday Feb 23rd: **Reading break, no classes, no labs**
Thursday Feb 29th: Last day for dropping courses without penalty of failure
Friday March 1st: Deferred midterm exam
Week of March 11th: Laboratory **Exam**
Week of March 25th: *My Gene* Laboratory **presentations**
Friday March 29th: **UVic closed, no lecture (Good Friday)**
Monday April 1st: **UVic closed, no lecture (Easter Monday)**
Monday April 8th: Last day of classes
Thursday April 11th- Friday April 26th: Examinations period

XII. General UVic regulations and Resources:

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>

It is your responsibility to be aware of ADD/DROP dates published in the Calendar. If you intend to drop this course, please do so officially and give up a space for students who might be on a waitlist.

You are expected to observe UVic standards of scholarly integrity especially with regards to plagiarism and cheating. If you cheat during an exam, you will be graded with 0 for this exam and the incident will be reported. Further consequences might apply. 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.

Resources at UVic to maintain a healthy student life:

- If you have any **technical issues** using Brightspace, please contact the **computer help desk** via email (helpdesk@uvic.ca)

- **Support Connect:** 24/7 help by phone or online

<https://www.uvic.ca/student-wellness/contacts/emergency-contacts/index.php#ipn-supportconnect-24-7-help>

- **Student Wellness Centre** to support students' mental, physical and spiritual health

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

- **Centre for Accessible Learning** - The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <https://www.uvic.ca/services/cal/>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

- **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/index.php>

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

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

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

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

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

<https://uvicbounce.ca/>

We hope that you enjoy a great spring term with Biol230 Genetics!

End of course outline

