

# WELCOME TO 'CHEZ GENETICS'

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## FEATURED CHEFS

Dr. Andrew Schofield ~ *Specialty:* Mendelian genetics, problem solving, molecular biology and control of gene expression

Dr. Paul Bentzen ~ *Specialty:* Chromosomes, mutations, biotechnology, gene editing and applications

Front of House ~ Debra Grantham: *Please contact for seating, assistance, and suggestions for improvement*

## APPETIZER

Why are you here? Why genetics?  
Orientation Mixer in first meeting  
What are the options? (Syllabus)

## MAINS

Unit 1- How are traits transmitted from parents to offspring, really? Why do we all not look identical?  
*(Problem-solving skills through Achieve, flipped lectures, labs, relating genetics to society)*

Unit 2- How are traits encoded, in what form, and how does a cell know to express them?  
Why aren't all the cells in the body with identical DNA sequences the same?  
*(Critical thinking skills through flipped lectures and Achieve, researching and writing like a scientist in lab)*

Unit 3- How do we know about genes? How do genes change spontaneously, and how do humans create changes? *(Authentic research making a difference, applications of genetic theory)*

## DESSERTS

Friday Live interviews: Interact with diverse group of genetic researchers!  
Integrate genetics into your unique vision for yourself in science, or in a science career

## BEVERAGES

Building a cooperative and diverse learning community  
Learning together through peer instruction  
No deductions for trying and getting it wrong the first time

**Faculty of Science Course Syllabus (Section A)** (Updated Jan 3, 2023)**Department of Biology****BIOL 2030.03****Genetics and Molecular Biology****WINTER 2023**

*Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq.  
We are all Treaty people.*

*We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities  
who have been here for over 400 years.*

<b>Teaching Faculty:</b>	<b>E-mail</b>	<b>LSC Office</b>	<b>Student Hours (in-person or Genetics Lecture Teams)</b>
Dr. Andrew Schofield (Unit 1&2) he/him	<a href="mailto:a.schofield@dal.ca">a.schofield@dal.ca</a>	2122	Fridays 9:30 – 10:30 AM
Dr. Paul Bentzen (Unit 3) he/him	<a href="mailto:paul.bentzen@dal.ca">paul.bentzen@dal.ca</a>	6052	By appointment
Debra Grantham (Instructor, labs) she/her	<a href="mailto:grantham@dal.ca">grantham@dal.ca</a>	6089	Mon 11:35AM & Thu 9:35AM

**Technology**

BIOL 2030 will use Dalhousie-supported programs, mainly **Brightspace** and Microsoft **Teams**, and share files through Teams and Microsoft 365. All students have [free access](#) to Microsoft Office products and our assignment templates are all MS **Word**. A laptop or device with Teams, Word, Outlook and Chrome installed will give you the best class experience! Bring them to every class and lab if possible. Talk to Debra about loaners.

**Covid-19 Guidelines...What if I feel sick?** As Dalhousie members, we all have to respect our classmates and follow the Dalhousie Code of Conduct to reduce the chance of spreading Covid-19 to those still vulnerable who couldn't be vaccinated- check the [most recent guidelines here](#). In summary, BIOL 2030 will be asking everyone to **wear masks** when inside instructional classrooms or buildings and to **stay home** if you are sick. If you are well enough to work from home, you are expected to join class (labs or tutorials) through Teams. You have one SDA to use for any missed academic requirement throughout term (for a three day extension or opportunity to makeup) so please file the SDA using the form and link on our homepage in Brightspace.

**How will I be able to answer questions?** Helpful resources are plentiful- the textbook, our recorded mini-lectures, animations, self-quizzes, and tutorial questions and solutions are all excellent sources of trusted information. You can earn credit by participating in tutorials, completing the Achieve homework every week and completing the laboratory exercises within a reasonable time. Problem-solving takes a lot of practice, so we have found problems in the text, tutorials and Achieve that allow you to struggle with important concepts and practice solving them while earning points for trying. This is called *formative learning*.

**What are the Lecture times in the Timetable?** Chez Genetics meets Monday, Wednesdays and Fridays from 12:35 – 1:25 pm in the charming and intimate Scotiabank Auditorium (Auditorium 1) in the [Marion McCain Social Sciences Building](#). They are the principal way to learn and practice genetics, so you are expected to attend each lecture. There will often be pre-recorded short videos to view before you come (especially if we are doing an activity!) or questions to complete after lecture. There are also

animations and learning activities in the accompanying modules to help you practice the concepts. Checklists will help you keep on track. If you are ill, contact Debra and you can view those recorded lectures you've missed. Please join us for a wonderful meal of hearty problem solving and convivial company, with some spice thrown in! **Our first meeting** is Monday Jan. 9, 2023 in Scotiabank Auditorium.

**What are the Tutorial times?** A helpful and expert guide will host group work sessions in person solving those difficult tutorial questions in the Achieve assignments. They will not lecture at you, but you can discuss any tricky concepts, interpretations, or extensions of the ideas you have or need to solve problems. If you **participate**, you will receive course credit for doing so (9 weekly tutorials, Achieve Tutorial assignments worth 9%, participation worth 3%). Your first Tutorial is the week of Jan 15-21.

**What are the Laboratory times?** Laboratories are two-hour wet-lab sessions that allow us to tackle weightier problems, perform some experiments and collect data, and learn approaches to interpret that data. The week after your wet lab you will meet for one hour in a classroom with your pod and TA to continue the report work. You can confer with your pod of 4 and all contribute to the group in-lab assignments but show your unique and original work in your Epistasis report, Drafts and Final scientific paper which are all **individual**. Please see the [Lab info](#) in Brightspace for details (9 weekly labs total, worth 23%). Your first lab is the week of Jan 15-21 or Jan 22-28 (see **Laboratory Format**).

## Communication

**Questions related to content?** Post in the Discussion forum 'Any questions?' and your post will be answered in 24 hours. If you know the answer, please help out a classmate!

**Tutorial questions?** Ask during your **tutorial** session, weekly meetings held in LSC 334, except for T04 9n LSC 220.

**Need to talk to one of the lecturers about specific problems?** Drop into their student hours at their office (posted above) or make an appointment for an online or in-person meeting. Please wear a mask if you're meeting in person.

**Personal questions or problems affecting your success in this course?** I'm here to help you succeed in the class. We know you can improve and do well in genetics! Contact [Debra Grantham](#). Email responses may take up to 2 days and are not answered outside working hours – 9-5 Monday to Friday.

## Autonomy and independent learning

One of the most important outcomes of a university education and a skill that you can use forever is your ability to learn independently. We will guide you and give you opportunities and choice over what you do to learn as much as we can, but you are ultimately responsible for your learning in this, and any course. **We believe that you have the capacity to be successful at Genetics!** Please reach out to us if you're struggling and we'll do what we can to help.

## Course Delivery

**In-person lectures, tutorials and laboratories.** All students are expected to attend **all** lectures, tutorials, and labs. **If you are ill**, you are not expected to attend, but will be given temporary access to the recorded live lectures that you missed due to illness to help you catch up. If you are well enough to complete work through Teams (in-lab assignments or tutorial sessions) you are encouraged to do so or make up the work later. If extended illness and makeups are impossible, you will be excused from those assignments.

**Blended aspects:** Additional pre-lecture videos/animations, tutorial question solution videos, pre-lab videos and online pre-lab quizzes. Group assignments completed through Teams Files in breakout rooms.

## Course Description (from the Calendar)

The power and prominence of modern genetics are emphasized through a blend of classical and molecular approaches. Topics include: Mendelian, population and quantitative genetics; chromosome structure and variation; structure and function of nucleic acids; DNA replication, transcription and translation; gene expression; gene mutations; and genetic engineering. Course-based research experience in lab.

## Course Prerequisites

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### -Courses:

A grade of C or higher in BIOL 1010.03 or (BIOL 1020.03, BIOL 1030.03, BIOA 1002.03, SCIE 1507.09). RECOMMENDED: CHEM 1011.03 and CHEM 1012.03  
EXCLUSIONS: GENE 2000.03

### -Knowledge/skills:

You will draw on these skills you have developed in previous courses:

- Compare and contrast the fundamental characteristics of eukaryotic, prokaryotic, diploid and haploid organisms
- Describe the stages of mitosis and meiosis and the cell cycle.
- Recall the basic concept of heredity, and that genetic information is encoded in DNA.
- Define genotype, phenotype, chromosome, gene, allele, recessive and dominant.
- Contrast the basic differences between DNA and RNA and describe how information flows from DNA to RNA to protein.
- Identify the minimal regulatory elements and how they function in the control of gene expression of inducible operons in prokaryotes.
- Define the principal classes of physical and chemical mutagens, the changes mutation introduces to the amino acid sequence of a polypeptide, and the resulting effect on phenotype.
- Describe the basic methodology of gene cloning and DNA technology/biotechnology, some applications, and their ethical and societal implications.
- Interpret the concepts of evolution as changes in allele frequencies and the Hardy-Weinberg principle. Calculate expected genotype and allele frequencies in simple cases.



- Describe the components of a scientific paper.
- Collect scientific literature using library resources, incorporate information from them into a scientific paper, and properly cite these sources.
- Explain the importance of academic integrity

### **Course Objectives/Learning Outcomes**

If you've built on those skills through this course you can:

- Defend the importance of genetics to society and the study of biology and explain this to non-specialists.
- Manipulate Mendelian principles of heredity for both autosomal and sex-linked inheritance.
- Apply rules of heredity to the eukaryotic cell cycle. Relate meiotic crossing over and genetic linkage.
- Show how complex genetic systems lead to modifications of the basic principles of Mendelian inheritance.
- Summarize the basic principles of population and quantitative genetics and apply these principles to real biological systems.
- Diagram the structure of DNA, DNA replication, how DNA is transcribed to RNA, and how RNA is translated into proteins.
- Diagram the structure of RNA and how post-transcriptional processing modifies it prior to translation.
- Interpret genetic and protein variability using detailed knowledge of the genetic code and the processes of transcription and translation.
- Compare and contrast the regulation of gene expression in prokaryotic and eukaryotic cells
- Relate chromosome structure, the types of rearrangements that occur, and the consequences of variations in chromosomal number.
- Explain and illustrate the fundamental biochemistry required in the application of modern techniques of molecular biology: (i) gel electrophoresis; (ii) contemporary methods used for determination of DNA sequences, and the key similarities and differences among them; (iii) amplification of DNA via the polymerase chain reaction (PCR); (iv) evaluation of gene expression via quantitative PCR; (v) determination of epigenetic methylation of DNA sequences.
- Classify physical and chemical mutagens, identify chemical mutagens by the Ames test, and predict the effect of different types of mutation on phenotype.
- Describe recombinant DNA technology and different approaches to the genetic modification of multicellular organisms.
- Explain approaches to the study of genetic variation at the molecular level and some of the key applications of these approaches.
- Manipulate the theories and topics covered in lecture and readings by solving problems in lecture, tutorials and labs.
- Develop a testable scientific hypothesis and design a research approach with appropriate controls.
- Apply techniques used in genetic and molecular biology laboratories.
- Generate, organize, interpret, and critique data collected from experiments in the laboratory and communicate results by an original and individually written scientific paper.
- Summarize, cite and reference scientific literature to avoid plagiarism.

## Course Materials

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### If you'd like to learn well you'll need:

1. **Achieve Access (for grades from the tutorials) and a version of the text:**
  - **Option 1 (a good deal):** Achieve access + Pierce, Benjamin A. *Genetics, A Conceptual Approach* (7th ed) 2020. (Ebook) ~\$70.00 Willolabs through link in course Brightspace

**OR**

  - **Option 2:** Pierce, Benjamin A. *Genetics, A Conceptual Approach* (7th ed). 2020. NY: W.H. Freeman (Looseleaf) + Solutions Manual + Achieve access for ~\$117 Willolabs through link in course Brightspace
  - **Option 3:** Pierce, Benjamin A. *Genetics, A Conceptual Approach* (7th ed). 2020. NY: W.H. Freeman (Hardcover) + Solutions Manual + Achieve access for ~\$256 Willolabs through link in course Brightspace
  - If you are in need of an alternative option, please contact me at [grantham@dal.ca](mailto:grantham@dal.ca)
2. **BIOL2030 Course website:** Connect through my.dal.ca (Brightspace). Weekly modules to organize content, interactive lectures every Monday, Wednesday and Friday 12:30-1:30 pm Halifax time and weekly lab and tutorial sessions at your registered time. What is going on this week? What is due? What should I be working on?
3. **Microsoft Teams:** Install the desktop app early from Office 365 for interacting with your lab team members and the genetics Faculty.
4. **Lab coat:** Can be purchased through the [Dal Bookstore](#) for approx. \$25 or you can borrow one of our used ones during lab.

### Recommended:

5. Knisely, Karin. 2017. *A Student Handbook for Writing in Biology*. 5<sup>th</sup> ed. VA: W.H. Freeman. If you don't have a copy, follow the miRNA paper guidelines provided by the [instructor](#) and the Writing for Biology video series. Individual pages will be posted.

### For blended course delivery:

For labs and tutorials, as well as activities within the in-person lectures, BIOL 2030 will use Dalhousie-supported programs, mainly **Brightspace** and **Microsoft Teams**. You will also need to share files through Teams. All students have [free access](#) to Microsoft Office products and our assignment templates are all **MS Word**. A laptop or device with Teams, Word, Outlook and Chrome installed will give you the best class experience! Bring them to **every** class and lab if possible. Talk to Debra about loaners.

Pre-lab quizzes are through Brightspace, Achieve tutorial assignments are through Macmillan Learning's Achieve portal (link through our Brightspace) but **Midterms** are **in-person**, outside class times in the evenings, so check schedule carefully.

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**CLASS CODE OF CONDUCT**


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If you are on Dalhousie campus, for safety reasons you will need to wear a mask whenever you are inside an instructional space (classroom or lab). In this course, because your voice will be heard when we discuss societal issues based on genetics, consider extending this courtesy to everyone in the class. We are all learning and mistakes will be made and understand you can communicate your discomfort or opposition either in class or privately to me outside of class ([grantham@dal.ca](mailto:grantham@dal.ca)). I would appreciate suggestions on how to make BIOL 2030 more inclusive and diverse. We all have different stories and experiences, and our class is a safe space to share them.

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**Course Assessment**


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**Course assessments are designed to align with learning outcomes:**

**Formative(F):** Designed to give you immediate feedback on what you are learning- no or low marks but important for you to be aware of what you do know and do not know. This is called [Metacognition](#). If you've struggled in first year with getting the marks you wanted, now it the time to click on the Metacognition link and watch (and try!) Dr. Chew's recommendations. I've read many books and articles and his advice is still accurate and one of the best resources I've found for improving success! (Debra)

**Summative(S):** Designed to assess whether you have mastered all the learning outcomes, or which outcomes you have mastered. More weight for marks, to encourage you to prepare for them by practicing problems and testing yourself before the assessment.

**Both types of assessments are better for your learning if first attempted without looking at notes.**

<b>Component</b>	<b>Weight (% of final grade)*</b>	<b>Date</b>
<i>Achieve tutorial assignments (F) (best 9/10)</i>	9	Weekly, start at in-person Tutorial and complete by 5 days after your tutorial by 11:59 pm ( <i>none in Midterm weeks</i> )
<i>Participation (F)</i>	3	Participate in group work in tutorials; attend and ask questions, help others solve tutorial questions.
<i>Midterms (S) 3 midterms, 1 for each Unit Not cumulative, In-person</i>	60	<b>Wed Feb 15 6:30-8:30 PM (Ondaatje)</b> <b>Wed Mar 22 6:30-8:30 PM (Rowe 1028)</b> TBA, final exam period, scheduled By Registrar
<i>Lecture Assignment (Individual) Blog (S)</i>	5	<b>Tuesday Feb 28 by 11:30 PM</b>



***Laboratory Assignments:***


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*Individual:*

<i>Pre-lab quizzes/Epistasis report (5) (F)</i>	4	Due by lab start time
<i>Drafts of scientific paper (F)</i>	4	Due by lab start time, week after lab when peer reviewed
<i>Final version scientific paper (S)</i>	10	Due <b>April 11 by 11:30pm</b> at end of term. See lab schedule.
<i>Group:</i>		
<i>In-lab team assignments (F)</i>	5	Due by noon (12PM) the day after your lab session.

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale**

A+ (90-100) A (85-89) A- (80-84)	<b>Excellent</b>	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
B+ (77-79) B (73-76) B- (70-72)	<b>Good</b>	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
C+ (65-69) C (60-64) C- (55-59)	<b>Satisfactory</b>	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
D (50-54)	<b>Marginal Pass</b>	Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills.
F (<50)	<b>Inadequate</b>	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

**Course Policies**


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**LECTURE FORMAT:** In-person lectures will be the primary way to learn the content and is supplemented by assigned videos/animations/exercises in the module for that week. Lecture schedule with topics and readings is provided at the end of this syllabus. Checklists at the beginning of each module will guide you how to prepare to participate fully in all lecture activities. It would be useful to bring your laptop to our lecture meetings and open Teams in Scotiabank Auditorium.



**LECTURE ASSIGNMENT:** There is one lecture assignment following Unit 1 worth 5% of your total mark. It is an **individual blog post** on a topic that links lecture material to society. We hope you enjoy the opportunity to write a more informal writing assignment to demonstrate your application of genetics theory to the world we live in. It will be on a topic you choose and you can potentially explore the answer to one of the big, important genetics questions you have always been intrigued by in the past.

**TUTORIAL FORMAT:** Tutorial questions are embedded in each weekly module. Videos of worked solutions of certain example questions are provided Fridays after the last tutorial. There are specific tutorial TAs who understand the questions thoroughly and can help you if you become stuck.

- You have registered for a tutorial session (check Dal online) and you have the opportunity to work on the tutorial assignments there in groups with your classmates. You will be assigned a group or pod of 6 others to work with in your tutorial.
- The Achieve tutorial assignments open at your tutorial time. There is no embedded feedback in the tutorial questions at the beginning, so those are the ones to solve together in tutorial.
- Scrap paper or a notebook will allow you to work out problems.
- The Achieve tutorial assignments have half of their questions as the tutorial questions in the modules, and half are new Achieve questions on the same topics. There are no deductions for retrying questions or using hints up to 10 tries. If you give up and view the solution, you don't earn points for that question.
- The online Achieve tutorial assignment **opens at your tutorial time** and closes **five (5) days after your tutorial by 11:59 pm**.
- There are 10 assignments total, with your lowest mark dropped.
- **Participation:** The following criteria will be used: 1pt for coming more than 2 times, 2pts for coming to more than 50% of tutorials, and 3pts for more than 50% and being actively being engaged during tutorials (discussing with classmates, helping others, asking questions, working on problems together).

## IMP

Register for the Achieve and textbook access to complete the tutorial assignments through the **Achieve Tutorial Assignment link** in our Brightspace course **only**. **You will receive a codename to protect your identity and grades from Achieve.** See the options for access above, under Course Materials. **Tutorials will be held in person starting Monday Jan 17.** [Locations](#) in Brightspace.

**MIDTERM FORMAT:** All midterms will be **in person and held outside of class time, during the evenings**. **Midterm 1** will cover Unit 1, **Midterm 2** will cover Unit 2, and **Midterm 3** will cover Unit 3. *Midterms are only on each Unit, (not cumulative) so the weighting cannot be changed.* These tests are designed to assess you on the learning outcomes in the weekly modules, interactive lectures, the text readings and tutorials. You will not be tested on topics you've only learned about in the labs. The midterms consist entirely of questions requiring multiple choice answers and will be time-limited so you need to completely understand the concepts.

You are expected to uphold **academic integrity** standards and **rely on your knowledge and practice of problem solving**.

**The final test, Midterm 3, will be held during the exam period:**

[https://www.dal.ca/academics/exam\\_schedule/halifax\\_campus\\_exam\\_schedule.html](https://www.dal.ca/academics/exam_schedule/halifax_campus_exam_schedule.html)

Alternate writing times for tests will be offered to students who have another Dalhousie exam or class at the same time or who are ill. Students who have a timing conflict with another class should contact the [Instructor](#) at least **three days** prior to the test date to arrange another time. Students who feel ill should see the “Course Policies on Missed ...” policy below.

**MIDTERM VIEWING:** There will be brief viewing sessions after each test to look at your test. Watch for Announcements in Brightspace as to the date and times of the review sessions. Contact the lecturer if you have any questions about the test.

**LABORATORY FORMAT:** Labs will begin as weekly wet labs in LSC 6009 or 6012 with collaborative work in pods of four students. Pods will be assigned in advance of the first lab.

- **Sections B01, B02, B03, B04 and B05 will have their first lab the week of Jan 16-22.**
- **Sections B06, B07, B08, B09, B10 and B11 will have no labs that week (Jan 16-22) but will have their first lab the week of Jan 23-29.**

In either case, labs are busy so you need to come prepared by doing the pre-lab reading and quiz if there is one.

Check the [lab schedule](#) for the complete term schedule. DAL ONLINE shows in which lab section you have registered. **ALL Lab content** is in a separate LABS folder at the top of the Table of Contents.

- Online pre-lab quizzes must be completed up to 5 minutes before lab begins.
- In-lab assignments are due by noon or 12PM AST of the day **after** your lab session.
- Although data is collected together, and group in-lab assignments will be collaborations of your pod, **all written work on your epistasis report, drafts and final scientific paper is individual.**
- Drafts of your scientific paper sections are due at the **start** of the lab session when they will be peer-reviewed by your pod mates. You will then have a week to make edits based on the suggestions of your peers and submit for TA feedback to the assignment dropbox **before your next wet lab** (check the lab schedule for due dates).
- Drafts and the final version of your miRNA paper will be screened **by Urkund** for plagiarism.
- Late lab assignments will receive a 5% deduction for each day late, to a maximum of **5** days late.
- **Unfortunately we can't allow you to switch labs because of space limitations. If you are sick and need to attend a different lab please contact Debra.**

### Course Policies on Missed or Late Academic Requirements

**Requests for an alternative quiz time due to extenuating circumstances:** If you have another Dalhousie class or exam scheduled at the same time as our Unit midterms or have another type of unavoidable conflict with the test, please should contact the [Instructor](#) at least three days prior to the quiz date to arrange another time.

**Missed Midterms, tests, tutorial assignments, labs or lab reports due to illness or other exceptional circumstances:** We understand that you may feel ill and should not come to Dalhousie campus. We support this! If you are slightly ill or waiting for Covid test results and can still do some coursework, you should do so and join the class work via Teams if possible. In any case, contact the [instructor](#) to arrange accommodations:

- If you must miss a due date because of illness or other reasons:

1. **Notify the [Instructor](#)** by e-mail **prior** to the academic requirement deadline or scheduled time to arrange a makeup or extension. Accommodations will depend on your situation and will be decided with the Instructor, Debra.
2. **Submit a Student Declaration of Absence Form through Brightspace** within three (3) days following the last day of absence. Can be used **once** per term for absences of **3 days or less** only. For more [info](#)
3. For absences of **longer than 3 days**, current regulations established by the University state students cannot submit a Student Declaration of Absence Form. Please contact the [Instructor](#).

There will be times during your term when you will have deadlines in several different courses at the same time. **PLAN AHEAD. WORK CONSISTENTLY. TEST YOUR RECALL.** Your time at University should, among other things, teach you to develop effective time management skills and study habits. On the other hand, unforeseen events such as personal/family crises or illness can occur during the term. These occurrences are unavoidable, and the teaching staff of 2030 will be most understanding and willing to make alternate arrangements. Please speak to one of the teaching staff.

### **Course Policies related to Academic Integrity**

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In BIOL 2030, group work in lecture, tutorial and lab is encouraged. You will be placed in pods of 6 people for tutorials and pods of 4 for labs.

- In tutorials, you are encouraged to discuss the questions as you complete the Achieve questions together and help your podmate's understanding (think like a tutor or TA : ).
- In labs, you can discuss questions with your pod of 4 and all can contribute to a single group in-lab assignment.
- You should show your unique and original work in the Epistasis report, your drafts and final scientific paper, which are all **individual** and **in your own voice** (no direct quotes from other sources- we want to know what you think!).

The blog, epistasis report and drafts and the final version of your scientific paper will be screened for plagiarism by **Urkund**.

**Use of any online "homework" sites like Chegg or CourseHero** will lead to an academic integrity investigation.

**Midterms are individual, in-person only, and not collaborative.** Even though you work together to learn and prepare for the midterms, know that you will need to rely on your own **knowledge, recall and problem-solving abilities** when assessed in your midterm, so **practice these skills throughout term if you want to do well.**

## Course Content

**BIOL 2030.03 TENTATIVE Lecture Outline Unit 1 (WINTER 2023)**  
(Changes to these readings may occur and will be announced in modules)

Module	Dates	TOPIC	Pierce 7th edition (pages)	Tests and Assignments
1	8-Jan 14-Jan	M1: Genes, chromosomes, and the copying genetic information	Ch 1.1 & 1.3 (p5, 12-13) Ch 2 Intro & 2.1 (p17-21)  Ch 2.2 (p20-25) Ch 2.3 up to Fig. 2.18 (p27-35)	
2	15-Jan 21- Jan	M2: Heredity - Basics and Extensions & Modifications	Ch 3.1 & 3.2 (p48-67) Ch 3.3 (p56-67) Ch 5 Intro to 5.2, not dog coat colour (p110-127)	<b>Achieve Tutorial 1 assignment</b>  <b>Labs begin</b>
3	22-Jan 28- Jan	M3: Binomial Expansion, Sex Determination, Sex-Linkage	Ch 3.2 (p58-60)  Ch 4 Intro to 4.3 (p81-99)	<b>Achieve Tutorial 2 assignment</b>
4	29-Jan 4- Feb	M4: Linkage Mapping in Eukaryotes, Mendelian Basis of Quantitative Genetics	Ch 7.1 & 7.2 (p180-190 & p193-195) Ch 7.3 Effects of Multiple Crossovers (p203-204)	<b>Achieve Tutorial 3 assignment</b>
5	5-Feb 11-Feb	M5: Quantitative Genetics and Population Genetics  M5: Capstone Lectures ... watched in preparation for upcoming Blog Post (Lecture Assignment due <b>Feb 28th</b> )	Ch 24.1 (p732-737) Ch 24.2 & 24.3 (743-752) [self review p737-743] Ch 25.1 to 25.3 (p766-774)	<b>Achieve Tutorial 4 assignment</b>
<b>Unit I - Midterm 1: Feb 15 (M1, M2, M3, M4 and M5), McCain Aud 2 (Ondaatje), 6:30-8:30 PM</b>				

**BIOL 2030.03 TENTATIVE Lecture Outline Unit 2 (WINTER 2023)**  
(Changes to these readings may occur and will be announced in modules)

Module	Dates	TOPIC	Pierce 7th edition (pages)	Tests and Assignments
<b>6</b>	12-Feb 18- Feb	M6: DNA, RNA, Replication, & Transcription	Ch 10 Intro to 10.3 (p293-308) Ch 12 Intro to 12.4 (p345-366) Review Ch 2.1 to 2.3 (p23-35) Ch 13.1 to 13.4 (p379-396) Ch 17.3 (p507-508)	<b>No tutorial assignment; review sessions for Midterm 1</b>  <b>Midterm 1: Wed Feb 15 6:30-8:30 PM in McCain Aud 2 (Ondaatje)</b>
<b>Study Break</b>	<b>19-Feb 25-Feb</b>			
<b>7</b>	26- Feb 4- Mar	M7: RNA Interference and RNA Processing	Ch 14.5 (p424-427) Ch 17.5 (p515-517) Ch 19.2 & 19.6 (p574-578, 601-602) Ch 14.1 to 14.4 (p405-424) Ch 17.4 (512-514)	<b>Lecture Assignment: Blog Post – Feb 28</b>  <b>Achieve Tutorial 5 assignment</b>
<b>8</b>	5-Mar 11-Mar	M8: The Genetic Code and Translation	Ch 15 Intro to 15.2 (p435-446) Ch 18.1 (p528-530) Ch 15.3 & 15.4 (p446-458)	<b>Achieve Tutorial 6 assignment</b>
<b>9</b>	12-Mar 18-Mar	M9: Regulation of gene expression	Ch 16.1 & 16.2 (p470-484) Ch 13.2 & 13.3 (p383-392) Ch 11.1 (p320-325) Ch 17.1 to 17.3 (p502-05, 510, 517-18) Ch 21.1 & 21.2 (651-653; 656-658) [Self-review: Ch 13.4 (p392-396) and Ch 14.2 (p416-418)]	<b>Achieve Tutorial 7 assignment</b>
<b>Unit 2 - Midterm 2: March 22 (M6, M7, M8 and M9), Rowe 1028 (Potter), 6:30-8:30 PM</b>				

**BIOL 2030.03 TENTATIVE Lecture Outline Unit 3 (WINTER 2023)**  
(Changes to these readings may occur and will be announced in modules)

Module	Dates	TOPIC	Pierce 7th edition (pages)	Tests and Assignments
<b>10</b>	19-Mar 25-Mar	M10: Variations in chromosomes and consequences	Ch 8.1 to 8.4 (p224-228) Ch 18.1 to 18.3 (p525-545)	<b>No tutorial assignment; review sessions for Midterm 2</b>  <b>Midterm 2: Wed Mar 22 6:30-8:30 PM in Rowe 1028 (Potter Auditorium)</b>
<b>11</b>	26- Mar 1- Apr	M11: Tools of the Geneticist	Ch 19.1, 19.3 (p569-571, 579-586) Ch 19.5 (p590-594) Ch 11.1 (p318-319) Ch 20.1 (p618-623, 625-628)	<b>Achieve Tutorial 8 assignment</b>
<b>12</b>	2-Apr 8-Apr	M12: REs, Recombinant DNA tech, cloning, GMOs, CRISPR	Ch 19.1 (p569-574) Ch 11.3 (p327-328) Ch 19.3 (p582-587) Ch 14.5 (p426-427) Ch 19.2 & 19.7 (p574-578; 604-605)	<b>Achieve Tutorial 9 assignment</b>
<b>13</b>	9-Apr 11-Apr	M13: Epigenetics and Unit 3 Wrap up	Ch. 21 (653-658)	<b>Achieve Tutorial 10 assignment – due by Apr 12</b>
<b>Unit 3 - Midterm 3: During Final exam period (M10, M11 and M12), Dalplex</b>				

**Faculty of Science Course Syllabus (Section B)  
Fall/Winter 2022-23  
BIOL 2030.03 Genetics and Molecular Biology**

**University Policies and Statements**

**This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate**

**Academic Integrity**

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

**Accessibility**

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

**Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

**Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

**Statement:** <http://www.dal.ca/cultureofrespect.html>

**Recognition of Mi'kmaq Territory**

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Important Dates in the Academic Year (including add/drop dates)**

<https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=117&chapterid=-1&topicgroupid=31821&loaduseredits=False>

**University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)



**Faculty of Science Course Syllabus (Section C)  
Fall/Winter 2022-23  
*BIOL 2030.03 Genetics and Molecular Biology***

**Student Resources and Support**

**Advising**

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

**Academic supports**

**Library:** <https://libraries.dal.ca/>

**Writing Centre:** [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

**Other supports and services**

**Student Health & Wellness Centre:** [https://www.dal.ca/campus\\_life/health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness.html)

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

**Safety**

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

**Dalhousie COVID-19 information and updates:** <https://www.dal.ca/covid-19-information-and-updates.html>