

## **BIOL 2040.03 Evolution**

*Fall Semester 2019-2020*

Lecture Instructor: Mark Johnston

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Lab Instructor: Elizabeth Welsh

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**LECTURES:** Lectures are held in the LSC-common area room 242 on Tuesdays and Thursdays from 10:05 - 11:25 am.

**LABORATORIES:** students are required to attend a two-hour lab every week (nine labs in total).

The labs are held in the LSC Room 4012 during the following days and times:

B01 Tuesday 1135-1325

B03 Wednesday 1235-1425

B02 Tuesday 1435-1625

B04 Wednesday 1535-1725

B05 Thursday 1435-1625

**COURSE DESCRIPTION:** A thorough overview of the process of evolution. Genetic variation and changes in genetic composition of populations, the relationship between genetic and phenotypic change. Adaptation at various levels of organization (DNA to species), speciation, phylogeny, and macroevolutionary patterns. Introduces the full breadth of evolutionary concepts, preparatory to more advanced courses.

**Prerequisites:** A grade of C or higher in BIOL 1010.03 or BIOL 1020.03 or BIOL 1031.03 or BIOA 1002.03 and BIOA 1003.03, or SCIE 1506.09 and SCIE 1507.09, or equivalent.

**Recommended:** SCIE 1111.03 Writing for the Sciences

**KEY KNOWLEDGE OR SKILLS** expected of students coming into the course and course student learning outcomes can be found at this link: <https://biology.academics.cs.dal.ca/daedalus/browse/course>.

**TEXTBOOKS and LAB MANUAL:** These are available to purchase in the Dalhousie bookstore.

There are also copies of the textbooks for you to borrow for a short period of time in the Killam Library.

1) Herron J, Freeman S. 2014. Evolutionary Analysis. 5<sup>th</sup> ed. Glenview (IL): Pearson Education. 850 p.

2) Knisely, K. 2017 A Student Handbook for Writing in Biology. 5<sup>th</sup> ed. Sunderland (MA): Sinauer Associates. 288 p. (note; this is also required for other Biology courses).

3) The lab manual for BIOL 2040.03 Evolution, *Fall semester, 2019-2020*.

**COURSE WEBSITE:** Go to [www.dal.ca](http://www.dal.ca) and then *Brightspace*.

**COURSE ASSESSMENT:** The marks will be assigned as follows:

Midterm	25 %	Final exam	45 %
Lab	30 %	<b>Total</b>	<b>100 %</b>

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

A+ (90-100)	B+ (77-79)	C+ (65-69)	<b>D</b>	(50-54)
A (85-89)	B (73-76)	C (60-64)	<b>F</b>	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

# COURSE POLICIES

## ATTENDANCE GUIDELINES

**The midterm exam** will be held in the evening on the date specified in the schedule (see page *vi*) unless otherwise communicated. If you cannot write the midterm at the scheduled date, you must notify [Prof Johnston](#) before the time of the midterm exam and be prepared to provide official medical documentation that clearly explains your absence within three (3) calendar days. Permission to write a makeup midterm exam is at the discretion of the professor.

**The final exam** will be held during the formal exam period scheduled by the registrar. Students are expected to be available throughout the final exam period. If you cannot write the final exam at the scheduled date, you must notify [Prof Johnston](#) on or before the day of the exam and be prepared to provide official medical documentation that clearly explains your absence within three (3) calendar days. Permission to write a makeup final exam is at the discretion of the professor. Please consult the [university regulations regarding exams](#).

**Laboratory attendance is mandatory.** An unexcused lab absence means you cannot hand in the assignment for that lab and will receive a grade of zero for that assignment.

***If you must miss a lab*** due to illness, sports event or another major event;

- Contact [Elizabeth Welsh](#) prior to your regular laboratory time.
- Check the lab schedule and plan to attend another lab time that week (unless excused by Elizabeth).
- You are still responsible for the lab assignment at the usual time, extensions for lab assignments are only given at the discretion of the lab Instructor, Elizabeth.
- Fairness for all students in the course - a busy academic workload is not a valid excuse for an assignment extension for individual students.

## LAB ASSIGNMENT GUIDELINES

### ➤ **Pre-lab quizzes are .....?**

- worth 2 of the 30 lab marks.
- to be completed before each new lab (see schedule page *iv*).
- to be submitted by **11:30 am on Tuesdays** the week they are due.
- available on the course website for about a week. Read over the lab before you begin.
- set up for **one attempt** and **five minutes** to answer the questions and submit your quiz.
- usually reliable but, please report any difficulties to Elizabeth well in advance of the due date to be reset.

### ➤ **When are the lab assignments due?**

Before the start of your regular lab time. Check the schedule on page *vi* for due dates.

### ➤ **Should I use a template for the assignments?**

Yes. There will be a word document template posted on the course Brightspace site under the LABS icon. It will include the questions and any tables, so all you need to do is fill in your answers, properly format, save your file and submit the completed assignment (as a pdf) to the appropriate Dropbox on Brightspace.

### ➤ **In what type of file should lab assignments be submitted?**

Save the template with your completed answers **as a pdf** for submission to Brightspace. We have found that this works best. If you use another format you may be asked to resubmit your assignment before grades are recorded.

### ➤ **How do I know if my assignment was submitted correctly?**

Check that you get a confirmation email from Brightspace *and* check your submitted file before assuming your assignment was submitted correctly. You can submit multiple copies, but only the most recent version will be kept.

- **Can I still hand in an assignment after the due date and time?** Yes, late assignments will be accepted but there are consequences. There is a penalty of **10% per day** including weekends. Before midnight the same day it was due is -5%.
- **I have most of my assignment finished but just have one question left. Can I submit what I have completed and just incur a late deduction on the late section?**  
No, late deductions are based on the total value of the assignment. You may want to compare the value of the uncompleted question(s) and the value of the late deduction when choosing what to do.
- **Can I e-mail my assignment for grading?** No. Submit the assignment to the course Brightspace site.
- **Can I skip a transfer lab?** No. Attendance is mandatory at all labs *including* transfer labs at your scheduled lab time. An unexcused absence of a transfer lab will result in a 10% deduction off your final fly report.

**Plan ahead!** Save your work in several places and don't leave things to the last minute! The following are *examples* of excuses that **do not** qualify for an extension for a lab assignment:

- |  |   |
|--|---|
| 1. Forgetting to submit the assignment                   | 2. Submitting the wrong file                      |
| 3. Studying for a midterm / completing other assignments | 4. Computer crashes (unless excused by Elizabeth) |

## ACADEMIC INTEGRITY

*Do NOT COPY or SHARE answers to any questions submitted for marks.*

See the questions and answers below and also this link, [Academic Integrity](#) for more information.

- **Since we work in groups, can we hand in the same assignments?**  
No. You are encouraged to collaborate on data collection or broad general concepts with fellow students especially during the lab time. However, you must produce independent reports written in your own words that are submitted for grading.
- **Another student asks to see what I have written on an assignment. Should I give them my assignment to look at?**  
Absolutely not. If that student intentionally or unintentionally copies your work, your name will go to the Academic Integrity Officer for the Faculty of Science and you can be found guilty of an academic offence. You may receive the same consequences as the person who copied your work.  
**The better option** - give some general ideas on how to answer a question or send them along to the Lab Instructor or the TA, we are happy to help with any questions.
- **If, after I have completed this course, a student asks to use my assignments should I pass them along?**  
No. If that student copies your work and submits it as their own, your name also goes to the Academic Integrity Officer with a charge of an academic offense. You can be found guilty and face the same consequences as the person who copied your work.
- **What if someone obtains my assignments and uses them?**  
You are responsible to keep your work safe.
- **What is Urkund?**  
This is a software program that Dalhousie University has adopted to detect for originality of written work. Be very careful with your answers on assignments. Your work will be submitted into Urkund when you submit your assignments. Please see [Student Submission of Assignments & Use of Originality Checking Software Policy](#)

## 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://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### **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)

### **Missed or Late Academic Requirements due to Student Absence (policy)**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html)

## 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/academic-advising.html>

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

Black 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)

Stay on Track student program: [https://www.dal.ca/campus\\_life/academic-support/On-track/stayontrack.html](https://www.dal.ca/campus_life/academic-support/On-track/stayontrack.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/services-support/student-health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness/services-support/student-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

Research Lab Safety [https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab\\_policy\\_manual\\_2007.pdf](https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab_policy_manual_2007.pdf)

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>

## IMPORTANT TELEPHONE NUMBERS

**FOR ALL EMERGENCIES call 4109** from any Dalhousie phone, or dial 494-4109 from an outside (non-Dalhousie) line (for fire, police, ambulance, Dal Security Emergency).

**Emergency (4109)** calls are routed through Security Office. Security Personnel then coordinate the notification and direction of the various emergency services.

**NON - EMERGENCY NUMBERS:** Dal Security & Maintenance after hours 494-6400

Health Services: Howe Hall 2171, QE II Emergency 9-428-2043, Poison Control Ctr Info 9-428-816

Tentative **Lab and Lecture Schedule for the Fall Semester 2019-2020**

Date	Lecture	Read	Assignment Due	Laboratory
September 2-6	L1 Conspectus Evolutionary Biol L2 Evidence for evolution	Ch 1 Ch. 2	.....	<i>No Labs this week</i>
September 9-13	L3 Natural Selection L4 Reconstructing Phylogeny	Ch. 3 Ch. 4	.....	<b>Evolution Escape Room!</b> <b>Lab 1(a):</b> Fly lab Practice
September 16-20	L5 Reconstructing Phylogeny L6 Mutation & Genetic variation	Ch. 4 Ch. 5	<b>Fly Lab: Materials &amp; Methods (1.5%)</b>	Prelab Quiz for Lab 1 <b>Lab 1 (b):</b> Fly Lab Cultures
September 23-27	L7 Population Genetics L8 Population Genetics	Ch. 6 Ch. 6	<b>Fly Lab: Introduction (3%)</b>	Prelab Quiz for Lab 2 <b>Lab 2:</b> Marble Lab (Fly Lab: Remove adults)
Sept 30- Oct 4	L9 Population Genetics L10 Population Genetics	Ch. 7 Ch. 7	<b>Marble Assignment (3.5%)</b>	(Fly Lab: 1 <sup>st</sup> transfer)
<b>October 1 – exam schedule posted, October 2 – last Day to drop fall term courses without a “W”</b>				
October 7-11	L11 Multiple Loci: Why Sex? L12 Multiple Loci: Why Sex?	Ch. 8 Ch. 8	.....	Prelab Quiz for Lab 3 <b>Lab 3:</b> DNA Sequences Lab (Fly Lab: Remove adults)
October 14-18	L13 <b>MIDTERM EXAM</b> (evening) L14 Multiple loci: Quant Genetics	Ch. 9	.....	<i>Thanksgiving on Monday</i> (Fly Lab: 2 <sup>nd</sup> Transfer)
October 21-25	L15 Multiple loci: Quant Genetics L16 Multiple loci: Quant Genetics	Ch. 9 Ch. 9	<b>DNA Sequences: Assignment (3.5%)</b>	Prelab Quiz for Lab 4 <b>Lab 4:</b> Phylogeny Lab (Fly Lab: Remove adults)
Oct 28 - Nov 1	L17 Studying Adaptation L18 Studying Adaptation	Ch. 10 Ch. 10	<b>Phylogeny Lab: Assignment (3.5%)</b>	Prelab Quiz for Lab 5 <b>Lab 5:</b> Beetle Lab Fly Lab: Finish, enter data
<b>October 31 – last day to drop fall term courses with a “W”, Last day to drop X/Y courses without a “W”</b>				
November 4-8	L19 Sexual Selection L20 Why do we get old?	Ch. 11 Ch. 13	<b>Beetle Lab: Assignment (3.5%)</b>	Prelab Quiz for Lab 6 <b>Lab 6:</b> Duck Lab
November 11-15	<b>Fall Study Break ~ no classes</b>	.....	.....	<b>no labs</b>
November 18-22	L21 Life-History evolution L22 Speciation	Ch. 13 Ch. 16	<b>Duck Lab: Assignment (3.5%)</b>	.....
November 25-29	L23 Speciation L24 Speciation & Macroevolution	Ch. 16 Ch. 16 & 18	<b>Fly Lab: Abstract Results Discussion (6%)</b>	.....
December 2-6	<i>* On Tuesday, Monday classes will be held</i>			
<b>Thursday December 5<sup>th</sup> – Sunday December 15<sup>th</sup> Dalhousie University Examinations</b>				