

## Syllabus

# Ecology & Evolution of Birds

Department of Biology

BIOL 4071, Fall 2025

*Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.*

*Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.*

### Course Instructor

Name	Email	Office Hours
Professor Glenn Crossin www.evophys.ca	Glenn.Crossin@dal.ca	By appointment, LSC 6060. Email me.

**Lectures:** M,W,F 13:35-14:25, LSC room 216  
Lectures delivered live and in-person only. They are not recorded.

**Laboratories:** n/a

**Tutorials:** n/a

### Course Description

This course provides a current and comprehensive account of avian biology – encapsulating their evolution, ecology, life-history variation, behaviour, reproduction, physiology, morphology, flight, and conservation. Whenever possible, I will highlight research on a species in question, and will also highlight work done by my students and me from our own research programs on birds.

Class size = 25

### Course Prerequisites

- A grade of B- (2.70) or better in each of the following prerequisite classes: BIOL 2003, BIOL 2040, BIOL 3026.

### Course Objectives/Learning Outcomes

At the end of this course students should be able to:

- A detailed examination of the evolutionary history of birds, extending from the dinosaurs.
- An examination of the anatomy of birds, and how form meets function.
- An examination of the adaptations and behaviours that suit birds to their environments.
- An understanding of the hormonal and physiological underpinnings of reproduction, migration, and behaviour.
- An understanding of the key physiological mediators of avian life-histories variation, including the timing of breeding, egg size and egg quality, clutch size, parental care (incubation and chick rearing), and trade-offs, costs of reproduction, and carryover effects.

### Course Assessment

Exam 1	40%
Exam 2	35
Exam 3	25
<b>Total</b>	<b>100%</b>

All exams are written exams. You will respond to short and long-answer questions. Responses must be legible. Grammar and syntax are important... points will be deducted if your meaning isn't clear.

A Bird song ID test usually occurs at the end of term, but due to the administrative lockout this is being cancelled for this year.

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

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

### Course Policies on Missed or Late Academic Requirements

Lectures are in person only, and are not recorded or broadcast synchronously. Students should attend class – all material for the exams comes directly from the class lectures. The copies of lecture material that I post to the Brightspace page do not contain all the details that I discuss in class, so you will not do well if you rely only on the slides without having attended the lectures. Come to class and take notes. If you miss a class, get notes from your peers.

**Without prior notification, a missed exam will involve a 5 percentage point reduction to that exam's grade (e.g. 100% changes to 95%, while 85% changes to 80%, etc). You MUST Inform**

**me by the night before an exam** if you are going to miss it, and at that time you must also submit a Self Declaration of Absence (SDA) form. **ONLY one SDA is permitted during the term.** Any make-up exam must be written within 2-3 days of the originally scheduled exam. For example, if the exam was on a Monday, you must then rewrite it by Thursday; if the exam was on a Friday you must rewrite on Monday. If the exam was on a Wednesday, then you must write it within 2 days, by Friday. Makeup exams will not be offered after this 2 or 3 day timeframe. Note that I am not obligated to provide you with a makeup exam, so excuses other than illness or extreme circumstance are unlikely to be considered. The weight of missed exams will not be redistributed across other exams.

**\*\* Note:** makeup exams are completely new exams – they will not be the same exam that your peers wrote in the classroom. It will ask different things and cover different topics, but all from the material expected for the exam as detailed in the syllabus. But it behooves you to take the in-class exam as makeup exams.

### **Course Content and Schedule of Lecture and Classes**

#### **LECTURES WILL TOUCH UPON:**

- Phylogeny of birds
  - Evolutionary origins and complete diversity of Class Aves, includes both extant and extinct lineages.
- Form and function
  - Feathers
  - Flight mechanics
- Anatomy and physiology
  - Thermoregulation
  - Respiration and circulation
  - Hormonal mechanisms controlling migration, reproduction, parental care, and moult
- Migration and navigation
- Social behaviour and communication
- Food and foraging

The content of this course and the schedule of lectures are captured below. Note however that the schedule is tentative, and subject to change. If a change should occur (e.g. due to a hurricane, etc), you will be informed in class.

**Note:** Due to the administrative lockout, we have lost nine lecture days, so the content of this course is not as extensive as it has been in the past. Nevertheless, after juggling the schedule, I have managed to keep the core material intact, and so you will definitely get a an excellent foundation in avian ecology and evolution, despite the lockout.

### **Tentative schedule ...**

Week of	Day	Lecture #	Topic
Sep 3 – 5	Wed	-	<b>Dalhousie Administrative Lock-out of the Faculty</b>
	Fri	-	<b>v</b>
Sep 8 – 12	Mon	-	<b>v</b>
	Wed	-	<b>v</b>
	Fri	-	<b>v</b>
Sep 15 – 19	Mon	-	<b>v</b>
	Wed	-	<b>v</b>
	Fri	-	<b>v</b>
Sep 22 – 26	Mon	-	<b>v</b>
	Wed	-	COURSE INTRODUCTION
	Fri	1	The Diversity of Birds
Sep 29 – Oct 3	Mon	2	On the Origins of Birds 1
	Wed	3	On the Origins of Birds 2
	Fri	4	Paleognathae
Oct 6 – 10	Mon	5	Neognathae: Galloanseres to Phoenicopterimorphae
	Wed	6	Columbimorphae to Otidimorphae
	Fri	7	Caprimulгимorphae to Opisthocomiformes
Oct 13 – 17	Mon		<b>No Classes - Thanksgiving</b>
	Wed	8	Cursoriimorphae to Phaethontimorphae
	Fri	9	Gaviimorphae to Procellariimorphae
Oct 20 – 24	Mon	-	<b>Recitation</b>
	Wed	-	<b>EXAM 1: Lecture 1-9 (40%)</b>
	Fri	11	> Research lecture: The Penguins & Egg Size Dimorphism
Oct 27 – 31	Mon	12	Coraciimorphae to Falconiformes
	Wed	13	> Guest Lecture: Dr Rob Ronconi ECCC (?)
	Fri	14	Passerimorphae
Nov 3 – 7	Mon	15	Avian Form & Function: Feathers
	Wed	16	Avian Form & Function: Flight
	Fri	17	Basic Anatomy & Physiology
Nov 10 – 14	Mon		
	Wed		<b>READING WEEK</b>
	Fri		
Nov 17 – 21	Mon	-	<b>Recitation</b>
	Wed	-	<b>EXAM 2: Lecture 10-14 (35%)</b>
	Fri	18	Food & Foraging
Nov 24 – 28	Mon	19	> Research lecture: Corticosterone, stress and foraging
	Wed	20	Social Behaviour & Communication
	Fri	21	> Guest Lecture – Dr. Andy Horn on Bird Song
Dec 1 – 3	Mon	22	Reproduction
	Wed	23	Migration and Navigation
	Fri	-	<b>Recitation</b>
Dec 8 – 10	Mon	-	<b>EXAM 3: Lecture 13-18 (25%)</b>
	Wed	-	Guest Lecture - Pending

## University Policies and Statements

### **Recognition of 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 at 1321 Edward St or [elders@dal.ca](mailto:elders@dal.ca). Additional information regarding the Indigenous Student Centre can be found at: [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

### **Academic Integrity**

Dalhousie University expects all of its students to espouse the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all of your academic dealings. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity: [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### **Accessibility**

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre: [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

### **Conduct in the Classroom – Culture of Respect**

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires your willingness to hear and tolerate opposing points of view. Respect for individual differences and alternative viewpoints is expected for all class members. The language used to express and respond to different points of view must remain within acceptable bounds of civility and respect; denigration and disparity will not be tolerated.

### **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. Dalhousie's Strategic Direction prioritizes the fostering of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.html>

### **Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. Dalhousie has the right to take disciplinary action if students breach the Student Code of Conduct. Violations of the code can be resolved in a reasonable and informal manner, e.g. through a restorative justice process. If an informal resolution can't be achieved, then a formal dispute resolution process would be initiated. The full Code of Student Conduct can be found at:

[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)

### **Student Use of Course Materials**

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.