

EEB386 H1S AVIAN BIOLOGY

Department of Ecology & Evolutionary Biology

UNIVERSITY OF TORONTO

2015 WINTER

Lecturer:	Michael Dennison, Ph.D
Office:	RW 014 (basement)
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Office Hours:	No set office hours. Immediately before Lab, or before and after lecture.
Lectures:	Tuesdays 5 PM – 7 PM in RWZL 110
Laboratories:	Tuesdays 7 PM – 9 PM in RWZL 013 (basement) *
Lab TAs:	Viviana Astudillo, Bronwyn Dalziel
Mid-Term Test	In class, Details will be provided.
Lab Test I	In class, Details will be provided.
Lab Test II	In class, Details will be provided.
Final Exam	Scheduled by the Registrar during the April Exam period. Two hours duration.
Course Website	BlackBoard portal (portal.utoronto.ca)

* There are two lab streams, so you attend one lab every two weeks, not each week. All attend the first lab. Details in first class.

COURSE DESCRIPTION

This course uses birds as model species to understand some of the general principles and key concepts in anatomy, physiology, behaviour, ecology, and evolution. In the first half of the course, we look at the avian flight system in some detail. In the second-half of the course, we look at how birds survive and reproduce. The laboratory classes emphasize avian anatomy, and include a bird song analysis exercise. A Field project component includes a field trip and an assignment based on your field observations.

At the end of the course you should be familiar with:

- the key features of the flight system of a bird
- the current theories on the origin and evolution of feathers, flight and birds
- species variation in beak morphology and its relation to feeding ecology
- the reproductive system, fertilization and oviposition
- breeding system variation and its causes
- patterns of bird song and visual displays
- current issues in avian conservation, including endangered species management
- the identification of some of the common winter bird species of Toronto

EVALUATION

Lectures	60%
Laboratory work	20%
Field Project	20%

EEB 386 2015 SCHEDULE

Lectures are on Tuesdays, 5 PM – 7 PM in RW 110; Labs are on Tuesdays, 7 PM – 9 PM in RW 013.

Weekk	Date	Lecture Topic	Lab topic
1	January 6	Intro – What is a Bird?	Bird Identification (Stream A+B)
2	Jan. 13	Origin and evolution of birds	Forelimb anatomy (A)
3	Jan. 20	Flight system - anatomy	Forelimb anatomy (B)
4	Jan. 27	Flight system - evolution	Skeletal anatomy (A)
5	February 3	Flight system - ecology	Skeletal anatomy (B)
6	Feb. 10	Mid-Term Test	Lab Test I

READING WEEK

7	Feb. 24	Avian Life cycles	Song analysis (A)
8	March 3	Bird song	Song analysis (B)
9	March 10	Avian reproduction I	Skull anatomy (A)
10	March 17	Avian reproduction II	Skull anatomy (B)
11	March 24	Feeding	Lab Test II
12	March 31	Conservation biology	<i>No Lab</i>

APRIL EXAM PERIOD

LECTURES

There are 11 lectures of 2-hrs each (One lecture period is taken up with the mid-term Test). The lecture topics and a brief description are as follows:

Week 1: What is a Bird?

As an introduction to this course, we look at the attributes of modern birds that make them such a distinctive group, and then survey modern bird diversity from various angles including evolutionary, ecological, behavioural, and anatomical. I will also describe how the course is run.

Week 2: Bird Origins

What is the current understanding of when birds originated and how they evolved?

Week 3: Flight system anatomy

Birds need feathered wings for powered flight, so we first look at the structure and function of feathers and wings.

Week 4: Flight system evolution

How did feathered wings and powered flight evolve?

Week 5: Flight ecology

Modern birds are quite diverse in their flight modes. We look at how variation in wing size and shape relates to lifestyle.

Week 6: Mid-term Test

No lecture. The Mid-term test will be written in lecture class.

Week 7: Life Cycles

How do birds fit the key life history stages of breeding, moult and migration into the annual cycle?

Week 8: Bird Song

Bird song is a special type of communication. We examine the ontogeny of song learning, and the function of song and calls.

Week 9: Bird reproduction I

We survey courtship behaviour and interpret it in light of sexual selection, and look at how ecological factors are important in determining mating systems in birds.

Week 10: Reproduction II

We examine the anatomy of the bird reproductive system, the process of oviposition, and we survey the diversity of developmental modes and parental care.

Week 11: Feeding

The bird beak is a very important evolutionary innovation that has resulted in wide diversification of feeding niches in birds. We look at food resource partitioning, and examine the classic case study of competition for food in Darwin's finches and its evolutionary consequences.

Week 12: Conservation

We look at patterns of bird extinction in oceanic regions, and examine some examples of management techniques that biologists are using to restore bird diversity on islands.

LECTURE ASSESSMENT

Lecture content is assessed with a mid-term test and a Final Exam. The mid-term test will assess your knowledge and understanding of Lectures 1-5 inclusive. It counts 25% towards your final mark. The Final Exam assesses lectures 7-12; it counts 35% of your final mark. The test and exam format is short- and long-answer questions. Further details in class.

LABORATORY WORK

There are five Lab topics, as follows:

Lab 1: Bird Identification

An introduction to the use of field marks to identify birds, and the field journal to keep notes on your field observations.

Lab 2: External Anatomy

Introduction to the external topography of the bird, with special emphasis on the wing. Study skins and wing specimens will be examined.

Lab 3: Skeletal Anatomy

Introduction to the skeletal anatomy of birds, with special emphasis on the flight apparatus - the pectoral girdle and forelimb. Whole-mount skeletons and sets of forelimb bones will be examined.

Lab 4: Song Analysis

Song structure and individual variation will be analyzed with sound analysis software.

Lab 5: Skull Anatomy

Bird skull anatomy, with an emphasis on the functional morphology of the jaw, and its relation to feeding.

LAB ASSESSMENT

Your lab work contributes 4% for each topic, for a total of 20% of your final mark in the course. Your lab work is assessed in a three ways: in-class worksheets (handed in at end of class), online quizzes (Portal), and two lab tests. The assessment details vary slightly among lab topics (e.g., there is no quiz for the Song Lab).

FIELD PROJECT

The field project gives you an opportunity to learn how to identify some of the common winter birds in Toronto, and how to take systematic field notes. You will maintain an online field journal of your field observations, and you will research and write an essay based on your observations and the literature.

As an introduction to bird identification in the field and making field notes, there are guided field trips in January to look at woodland birds, and waterfowl. Details in class.

Binoculars, a field notebook, and a bird field guide are recommended but not required.

The Field Project counts a total of 20% towards your final mark. It will be assessed based on your online Field journal, checklist, and an essay.

RECOMMENDED READING

There is no required text for this course. But it is recommended that you read as widely as possible. The following texts will be on short-term loan (3-hour) in Gerstein or Earth Science Library:

Gill, F.B. 2007. Ornithology. 3rd Ed. Freeman (or any earlier edition is fine).

Proctor, N.S., and P.J. Lynch. 1993. Manual of Ornithology: Avian Structure & Function. Yale U. Press.

DeLuiis, G., and D. Pulera. 2010. The Dissection of Vertebrates: A Laboratory Manual. 2nd ed. Academic Press.

King, A.S., and J. McLelland. 1984. Birds: Their Structure and Function. Balliere Tindall.

Whittow, G.C. (Editor). 2000. Sturkie's Avian Physiology. Fifth Edition. Academic Press.

LECTURE NOTES AND LAB RESOURCES

The lecture slides will normally be available on BlackBoard the day of the lecture. Normally, the lecture notes, including key figures, will also be available from BlackBoard prior to lecture. There is a set of study questions associated with each lecture; these are recommended for test and exam prep. An (online) lab manual and printed worksheet questions will be provided.

ABSENCES, MISSING A TEST, ETC.

Students who have been absent from class for medical or other unavoidable reasons AND require an accommodation for missed or late term work must record their absence using the ROSI Absence Declaration. You must also provide a U of T medical certificate in cases of illness.

If you miss the mid-test, a U of T medical certificate or a letter from your college registrar is required in order to request special consideration or to write a make-up test.

You must contact Dr. Dennison within 3 days of missing the mid-term test. Medical certificates must confirm your inability to attend the test and the dates of your illness, and must show that the physician was consulted at the time of the illness.

Students who miss the Final Exam in August must petition through your College to the Faculty. Late assignments or required work will incur a penalty deduction of 25% of the possible mark for the work.

ACADEMIC INTEGRITY

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently.

According to Section B of the University of Toronto's Code of Behaviour on Academic Matters (www.utoronto.ca/govcncl/pap/policies/behaveac.html) which all students are expected to know and respect, it is an offence for a student:

- To use someone else's ideas or words in your own work without acknowledging that those ideas/words are not your own with a citation and quotation marks, i.e., to commit plagiarism.

- To include false, misleading or concocted citations in your work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student.
- To submit your own work for credit where it has been previously obtained in more than one course without the permission of the instructor.
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are the most common. Please respect these rules and the values which they protect. Students are referred to the useful guide on referencing and citations called "How Not to Plagiarize" prepared by Margaret Procter, U of T Coordinator, Writing Support: www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize

ACCESSIBILITY

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: disability.services@utoronto.ca or www.accessibility.utoronto.ca/.

WRITING

You will be required to write assignments, as well as in test and exam essays and short-answer questions. There are excellent writing resources on campus, starting with the Writing at U of T website: www.writing.utoronto.ca, which includes a page of Frequently Asked Questions, a set of helpful Advice pages on academic writing of various types, information about Writing Centres and Writing Courses, and the latest News about writing support programs.

AUDIO RECORDING OF LECTURES

Taping lectures with a personal recorder is permitted, but if you bring a recording device to the front of the room, you do so at your own risk and you assume responsibility if it is lost or stolen. Lecture materials including audio recordings are for personal use only by students enrolled in EEB386H. The distribution, transmission, reproduction, or re-posting of the EEB386H lecture materials including audio recordings, in part or whole, is strictly prohibited without the written permission of the instructor. Students are advised not to treat recordings as a substitute for attending lectures and taking notes.