SC/BIOL 4250.03
Birds and the Environment
Fall 2008

Instructor: Dr. Scott A. Tarof
Office/Lab: 203H Lumbers
Phone: (416) 736-2100 x22331
Email: starof@yorku.ca
Office hours: T, R 11:00am-12:00pm or call/email for an appointment.

TAs:
Elizabeth Gow (Lab #1 Monday)
Office: 203C Lumbers
Phone: (416) 736-2100 x66637
Email: eliz_gow@yorku.ca

Patrick Kramer (Lab #2 Wednesday)
Office: 203C Lumbers
Phone: (416) 736-2100 x66637
Email: pkramer@yorku.ca

Course Description:
Welcome to the wonderful world of birds! Birds and the Environment (formerly “Ornithology”) provides an in-depth examination into avian biology and research. Avian studies remain a dynamic and driving force in biology. The subject matter is vast; we will only be able to study some of the information known about the secret lives of birds. Topics include diversity, anatomy/physiology, migration, mate choice, and conservation. This course is a demanding senior level course requiring diligence and dedication. Prerequisites: 1010.06 and 2030.05/2031. Calendar information is available at http://calendars.registrar.yorku.ca/calendars/2007-2008/Courses/biology.htm.

In lectures I will use the course textbook as an initial resource. Research articles showcased in lecture are required reading and will provide you with a stronger foundation by emphasizing advances in research, modern field and laboratory techniques used for answering previously intractable questions about birds, experimental design, and future research initiatives. In the lab students will explore hands-on exercises designed to complement lectures. Focus will be on developing field techniques, bird identification, taxonomy, and research breadth.

Learning Proficiencies:
1. Understand the evolution, definitive characteristics, and diversity of birds.
2. Identify and classify major representatives of the Class Aves.
3. Appreciate and describe in cogent detail avian external and internal anatomy and physiology with use of specific examples (e.g., flight, skeleto-muscular system, respiration, vocalizations).
4. Understand major aspects of avian ecology (e.g., migration, navigation, mating, parenting) and conservation.
5. Be able to define avian biology terminology, with examples.
6. Be able to understand and apply techniques used in avian field and laboratory research.
7. Collect, analyze, interpret, critique, and present original research.
8. Improve biological vocabulary, observation, and communication skills.

Course Format: Two 1.5-hr lectures and one 3-hr lab each week.

Lecture: T, R 8:30-10:00am (CLH Seminar Room 110)

Course information, including syllabus, PDF lecture outlines, handouts, and marking schemes is available at http://undergrad.biol.yorku.ca/~biol4250/ (slash after “4250” required). You must be able to access this website on/off campus. Bring posted lecture outlines to class, but they are NOT a substitute for coming to class.
Laboratory: M, W 2:30-5:30pm (131 Lumbers)  
A dissection kit is required (available at York University Bookstore).


Reference Texts: 
Peterson Field Guide (your own bird ID guide will be very useful)  

Evaluation:  
A+ 90-100% C+ 65-69% E Marginally <50%  
A 80-89% C 60-64% F <50%  
B+ 75-79% D+ 55-59%  
B 70-74% D 50-54%  

Please consult http://calendars.registrar.yorku.ca/calendars/2007-2008/Courses/biology.htm for additional academic information, including general grading scheme and GPA guidelines.

Lecture:  
Quizzes (2 X 5 marks) - 10 (2%) Unannounced  
Midterm Exam - 50 (20%) Tues. Oct. 21  
Final Exam - 100 (38%) TBA  
Academic Integrity Tutorial/Quiz - Complete by Fri. Sept. 12  

Laboratory:  
Long Point Field Trip - Sun. Sept. 21  
ROM Field Trip - Mon./Wed. Nov. 3/5  
Songbird Decline Project Paper - 20 (3%) Sept. 22 week  
Migration Project Proposal - 10 (1%) Sept. 29 week  
Migration Counts Project Paper - 100 (14%) Nov. 17 week  
AJC Seminar - 50 (8%) As Scheduled  
Lab Practical - 55 (14%) Nov. 24 week  

This course has lecture (60%) and laboratory (40%) components; you must pass both components to pass the course. There is one (1) required midterm lecture exam and one required cumulative final lecture exam. Lecture exams cover ALL lecture material and AJC presentations. Lecture exams will involve multiple choice, definitions, and short/long answer questions. There is a great deal of material to understand in this course; attendance is critical. Upon absence it is your responsibility to find out what you missed. There will be no individual negotiations regarding grades beyond corrections to errors in marking or calculations.  

Make-up exams (final exams excepted) may only be given for legitimate reasons (illness, family emergency, religious observance) that are supported by sufficient, reasonable and convincing written documentation. Such arrangements must be made in writing and immediately following an absence. Students who miss the final lecture exam or laboratory practical must request deferred standing and provide complete documentation (does not guarantee deferred standing will be granted). There will be no make-ups for unannounced lecture quizzes (illness or emergency excepted). Except for emergencies, prior notification of absence from lecture (or laboratory) must
be given to your instructor (or TA) to avoid a grade of zero on a missed exam or assignment. Late penalty will be 10% per day (including week-ends).

**Academic Policies and Misconduct:** Please treat the course instructor, your TA, and your peers with professional courtesy and respect. Students with extenuating circumstances that may interfere with their ability to complete course requirements successfully are encouraged to discuss the matter with the course instructor at the start of the course. Students with physical, learning, or psychiatric disabilities requiring reasonable accommodations in teaching style, resources, or evaluation methods should consult the course instructor and the Office for Persons with Disabilities (OPD) at the start of the course.

York University’s responsibilities include promotion of academic honesty, integrity, and procedures to deal with instances of academic misconduct. Students are responsible for understanding these policies (http://www.yorku.ca/secretariat/policies/document.php?document=69) and for honest and independent completion and representation of their work. Examples of academic dishonesty include, but are not limited to, any cheating on a quiz or exam, copying or erroneously referencing any work of another person under any circumstance, or presenting one’s work as his/her own that has not been written by that student. BIOL 4250 students must take York’s ~40 min. online tutorial on academic integrity by Friday Sept. 12. Go to http://www.yorku.ca/tutorial/academic_integrity/ and follow the instructions to begin the 16-page tutorial. On page 16 (after the three case studies) you will be prompted to take the quiz. At the bottom of page 16 are two red arrows; click on the upper arrow to first login using Passport York. The course instructor will receive a course report after the deadline to ensure that all students have completed this tutorial/quiz. **NOTE:** This quiz is not-for-credit for your course grade, but I will record whether or not you completed the tutorial. These policies are to ensure each student is aware of the seriousness of academic misconduct and its examples.

**Other Important Dates:**
- Last day of fall term classes: Tues. Dec. 2
- Fall exam period: Fri. Dec. 5 to Mon. Dec. 22
- Last day to enroll without instructor's permission: Thurs. Sept. 18
- Last day to enroll with instructor's permission: Fri. Oct. 3
- Drop deadline: Fri. Nov. 7
- Last date to submit Fall term work: Fri. Dec. 5
- Biology deferred fall exam period: Oct. 14-17

**Laboratory**

Labs begin the week of Sept. 8 and will involve indoor and outdoor hands-on exercises including bird identification (live, museum specimens), dissection, taxidermy, field trips, and research projects. Some lab time will also be dedicated to teaching research skills. **Dress appropriately for outdoor work!!** **Work efficiently and come prepared** (e.g., bring what you need for data compilation/analysis labs). Everyone is expected to participate in ALL lab activities. Students are urged to maintain a (not marked) lab notebook to keep lab notes and project data organized. The **cumulative** lab practical will be held during the last scheduled lab and will involve dissection and bell-ringer stations (more details to follow). All lab content, including AJC seminars and field trips, is testable on the lab practical; AJC seminar papers are testable content on lecture exams. **There are no make-up labs.** Lab assignments are outlined below. Internet sites, popular magazines/articles, newspaper articles, and assignment handouts are **NOT** acceptable literature sources for any assignment in this course. All literature sources must be peer-reviewed.

Students interested in learning about finding peer-reviewed, primary research articles online, course-specific searchable databases for research projects, academic copyright, or attending a library orientation workshop or tutorial (e.g., Steacie Science library) are invited to visit the main York Libraries homepage (http://www.library.yorku.ca/ccm/jsp/homepage.jsp). Under the “HELP with RESEARCH” section, click on “Tutorials and guides” for self-directed assistance or “Library workshops and classes” to view the workshops offered. For workshops specific to the sciences please visit http://www.library.yorku.ca/ccm/Steacie/library-workshops-2008.en.
York’s “Minibytes” program offers workshops (first come first serve basis) on using Microsoft Excel (Oct. 2, Nov. 24), Word (Oct. 15), and Powerpoint (Nov. 11). Schedule information is available at http://www.yorku.ca/hr/documents/Minibytes_Schedule.pdf. Interested students should inform their TA in lab so the TA can compile student names and ID numbers for the course instructor (who will notify the workshop Coordinator).

Field Trips: There are two required field trips in this course: (1) Royal Ontario Museum (ROM) in Toronto; (2) Long Point Bird Observatory (LPBO), located along the north shore of Lake Erie in southern ON (~2.5 hr drive). The ROM is world-renowned for its diverse and carefully preserved collection of natural history (e.g., Gallery of Birds, Bat Cave, Gallery of Reptiles) and world culture (e.g., Chinese temple art, First Peoples of Canada) exhibits. Our ROM trip will be during lab on Monday/Wednesday Nov. 3/5 and will involve a “behind the scenes” tour of the ROM’s Ornithology Collection and genetic research facilities. Emphasis will be on the value of museum collections, species diversity, ancient DNA samples, and sexual dimorphism. Students should take notes for the lab practical. Students can also explore public exhibits (http://www.rom.on.ca/index.php). Cost will be ~ $8.00/person for transportation plus $7.50/person admission fee. We will leave from lab 2:30pm sharp via TTC. Student will be required to complete and return one Biology field trip form (provided in lecture; one form per trip) in order to participate in these field trips. A letter is also available upon request from the course instructor for students whose parents may want written confirmation of field trips.

The LPBO all-day field trip has been scheduled for Sunday Sept. 21 during peak fall warbler migration. Students are encouraged to carpool and must be at LPBO by 8:45am (mist netting activities and guided tour begin at 9:00am). Students will observe dozens of different species of migratory birds up close and learn about identification characteristics and moultting patterns. Cost is $2.00/person plus gas (bring a bag lunch). There will be a short talk by Stuart MacDonald, Director. Students should take notes for the lab practical. More information and directions can be found at http://www.bsc-eoc.org/lpbo/migration.html.

Songbird Decline Research Project: In this small research project, students will choose a songbird that is declining in Canada, download North American Breeding Bird Survey (NABBS) data for that species and suitably plot the data in Excel, and write a short, formal publication-quality research paper reporting your findings. Guidelines on how to write a publication-quality biology research paper are available on the course website in addition to the aforementioned references on writing in science and how to read the primary literature. This assignment is intended to provide practice with publication-quality research and writing to better prepare students for their major research project in this course.

Migration Counts Research Project: Students will conduct a major, empirical field research project based on collecting migration count data of birds during autumn migration. This project is to be conducted and written up as a formal, publication-quality research paper. Data will be collected in groups; however, each student is responsible for independent data analysis and paper writing. A detailed project description will be provided in lab. Each student will also be required to write a brief project proposal to facilitate project organization and solidification of ideas for this assignment. A proposal template sheet will be distributed in lab (one proposal/group). Three research articles or reviews (5 copies of each) are on Reserve in Steacie library as resources for this project.

Avian Journal Club (AJC): The last 30 minutes of most lab sessions will be devoted to our “Avian Journal Club”. Each week one group of 3 students will present a 20-minute “round-table” seminar critique (no Powerpoint slides) of a 2006 or newer peer-reviewed primary literature article investigating a current topic on birds. Some issues to consider: How strong is the theoretical rationale for the study? Does the paper have strong statement of objectives, hypothesis, and predictions? Is the experimental design flawed? Are the results presented clearly? What analyses might be missing? Do the conclusions connect with the predictions? Did the authors test what they set out to test? Articles must be accessible via York University’s online system. Students will also lead a 10-minute engaging, discussion of their article. All students are responsible for reading and understanding each article presented because AJC articles are testable material for lecture exams. Presenters must provide the article reference to their lab section at least one week in advance to avoid a 5% deduction. Your grade will be based on your TA’s evaluation of the group presentation, averaged with the individual grades each presenter within a group assigns to their respective group members. If each group member gives each other 50/50 the TA will disregard the peer evaluation for that group; peer evaluations are to be an honest assessment of your peers’ contributions. Seminar guidelines will be discussed in lab.
**PLEASE TURN OFF YOUR CELL PHONE BEFORE COMING TO LECTURE & LAB! **

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<tr>
<th>WEEK</th>
<th>DATE</th>
<th>LECTURE</th>
<th>READINGS</th>
<th>LAB</th>
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<td></td>
<td><strong>Unit I: Diversity, Origins &amp; Systematics</strong></td>
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<tr>
<td>1</td>
<td>R Sep 4</td>
<td>Syllabus, Introduction, Scholarly Research</td>
<td>Pp. xxi-xxvi, Ch. 1</td>
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<td>2</td>
<td>T Sep 9</td>
<td>Evolution of Birds, Museum Collections</td>
<td>Ch. 2</td>
<td>Campus birding, Censusing &amp; mist netting, Introduce migration and songbird decline projects, AJC sign up</td>
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<td>2</td>
<td>R Sep 11</td>
<td>Species &amp; Systematics</td>
<td>Ch. 3, 19</td>
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<td><strong>Unit II: Anatomy &amp; Physiology</strong></td>
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<td>3</td>
<td>T Sep 16</td>
<td>Feathers &amp; Flight**</td>
<td>Ch. 4, 5</td>
<td>Migration project, TA demo of AJC critique (in afternoon lab time)</td>
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<td>3</td>
<td>R Sep 18</td>
<td>Annual Cycle, Dispersal, Migration &amp; Navigation**</td>
<td>Ch. 9, 10</td>
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<td>4</td>
<td>T Sep 23</td>
<td>Winter Ecology**</td>
<td>Ch. 10</td>
<td>Migration project, Songbird decline project due &amp; AJC 1 (in afternoon lab time)</td>
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<td>4</td>
<td>R Sep 25</td>
<td>Respiration &amp; Circulation**</td>
<td>Ch. 6</td>
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<td>5</td>
<td>T Sep 30</td>
<td><strong>No Class – Rosh Hashanah</strong></td>
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<td>No labs this week</td>
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<td>5</td>
<td>R Oct 2</td>
<td>Foraging &amp; Digestion</td>
<td>Ch. 6</td>
<td>Migration proposal due (in class)</td>
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<td>6</td>
<td>T Oct 7</td>
<td>Metabolism &amp; Excretion</td>
<td>Ch. 6</td>
<td>Feathers &amp; tracts, Dissection &amp; taxidermy, AJC 2</td>
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<td>6</td>
<td>R Oct 9</td>
<td><strong>No Class – Yom Kippur</strong></td>
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<td>7</td>
<td>T Oct 14</td>
<td>Nervous System &amp; Intelligence**</td>
<td>Ch. 7</td>
<td>Migration project, AJC 3 (in afternoon lab time)</td>
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<td>7</td>
<td>R Oct 16</td>
<td>Reproduction &amp; Hormones**</td>
<td>Ch. 14</td>
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<td>8</td>
<td>T Oct 21</td>
<td><strong>Mid-term Exam</strong></td>
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<td>Taxonomy, AJC 4</td>
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<td><strong>Unit III: Behavioural Ecology</strong></td>
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<td>8</td>
<td>R Oct 23</td>
<td>Life History, Reproductive Success, Senescence (EG Guest Lecture)</td>
<td>Pp. 336-338, Ch. 17</td>
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<td>9</td>
<td>T Oct 28</td>
<td>Social Behaviour &amp; Territoriality</td>
<td>Ch. 11</td>
<td>Migration project data compilation, Statistics tutorial, AJC 5</td>
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<td>9</td>
<td>R Oct 30</td>
<td>Mating System Ecology</td>
<td>Ch. 13</td>
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<td>10</td>
<td>T Nov 4</td>
<td>Mate Choice &amp; Displays</td>
<td>Ch. 12</td>
<td>ROM field trip (meet in lab BY)</td>
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10 R Nov 6 Vocalizations: Mechanics & Mate Choice Ch. 8
11 T Nov 11 Parental Care I: Nests & Incubation Ch. 15 Genetics lab tour, Bird song, AJC 7
11 R Nov 13 Parental Care II: Parents & Offspring Ch. 16 (R Kresnick Guest Mini-Lecture)

Unit IV: Avian Conservation
12 T Nov 18 Changing Landscapes: Habitat Loss, Ch. 18, 21 Lab practical review
   Behaviour & Urbanization (TM Guest Lecture)
12 R Nov 20 Brood Parasitism & Predation Pp. 377-385
13 R Nov 27 Ecotoxicology: Toxins & Other Contaminants Pp. 563-566 (PB Guest Lecture)
14 T Dec 2 Conservation Strategies & Applied Ch. 21 No labs this week
   Ornithology

** On these dates, T, R morning lecture time will be used for lab work (mist netting for migration project). ALL
students will be doing lab work on each of these mornings (ideally starting at 8am if possible to compensate for set
up time), grouped by lab section in different habitats (organized by your TA). Scheduled lectures on these dates will
be given during afternoon lab time (lectures repeated for each lab section).

Schedule and posted lecture outlines may change.

General References
F28 1988).