BIOL*3650 Applications in Biology

Winter 2018
Sections(s): C01

Department of Integrative Biology
Credit Weight: 0.50
Version 1.00 - December 22, 2017

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1 Course Details

1.1 Calendar Description

In this course, students will explore selected topics related to the application of biological knowledge and techniques in society, such as biotechnology, forensic science, conservation biology, agriculture, health care, public health, and wildlife biology. Different topics are offered each year, reflecting the particular research or professional interest of the course instructor. Upcoming topics will be posted on the B.Sc. Advising and CBS-ADA websites.

Pre-Requisite(s): 9.00 credits including (2 of BIOL*1070, BIOL*1080, BIOL*1090)
Restriction(s): Restricted to students in BIOC, BIOC:C, BIOD, BIOS, BIOM, ECOL, ECOL:C, HK, MFB, MICR, MICR:C, MBG, NANS, WBC, ZOO. This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations during certain periods. Please refer to the CBS ADA website.

1.2 Course Description

Wildlife rehabilitation is an important aspect of species protection and conservation, and is a valuable career path for individuals with a special interest in wildlife biology. This undergraduate course focuses on Canadian wildlife and ways to mitigate various human-animal impacts with a specific emphasis on wildlife rehabilitation: its benefits, risks (to humans and animals), ethical concerns, stabilization of sick and injured animals, and other key areas for consideration. Whether in a wildlife centre or in the field, understanding important physiologic differences between species and how to stabilize animals for subsequent treatment by a permitted rehabilitator or a wildlife veterinarian are discussed. There is a hands-on component to this course, including three hands-on labs where avian, mammal, and turtle natural history is discussed in the context of performing a necropsy on an animal, and basic treatments for animal first aid are practiced. Case studies, presentations, and lectures will make up the rest of the course.

1.3 Timetable

- Lectures
  - Thursdays from 2:30pm – 5:30pm, Room - SCIE 2314
  - Commencing January 11, 2017

- Labs
  - SCIE 2314

1.4 Final Exam

April 18th 8:30 - 10:30 AM

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2 Instructional Support

2.1 Instructor(s)

Sherri Cox
Email: coxs@uoguelph.ca
Telephone: +1-519-824-4120 x54100
Office: UC 437
Office Hours: By appointment.

2.2 Guest Lecturers

- Dr. Sue Carstairs, Executive & Medical Director, Ontario Turtle Conservation Centre
- Dr. Graham Crawshaw, Former Head Veterinarian, Toronto Zoo
- Mike McIntosh, Bear With Us, Wildlife Rehabilitator for Bears

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3 Learning Resources

- No required textbook
- There will be reference material on reserve in the library
- The use of online scientific journals will be part of the course

3.1 Required Resources(s)

Courselink (Website)
https://courselink.uoguelph.ca
This course will make use of the University of Guelph's course website on D2L (via Courselink). Consequently, you are responsible for all information posted on the Courselink page for BIOL*3650. Please check it regularly.

Dissecting Kit (Equipment)
Students are expected to bring their own dissecting kit to the labs. The kits should contain scalpel blades, a scalpel handle, non-traumatic tissue forceps, rat-tooth forceps, scissors, hemostats (curved or straight).

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4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Describe the goals and regulations involved in wildlife rehabilitation.
2. Compare key physiological and anatomical differences among mammals, birds, and reptiles that are of main consideration in wildlife rehabilitation.
3. Evaluate the ethical, animal welfare, and economic influences on the practice of wildlife rehabilitation.
4. Examine the professional development and personal growth involved in preparation for occupations related to wildlife rehabilitation.
5. Apply various stabilization techniques to help sick or injured native wildlife.
6. Identify reasons and common diseases that wildlife are admitted to rehabilitation centres.
7. Discuss ways to mitigate the negative impacts on wildlife from various human-wildlife encounters.
8. Explain, with examples, common terms used in wildlife biology.
9. Identify some species of special concern in Ontario and the Acts that protect them.
10. Discuss how various species defend themselves and how to maximize human and animal safety when handling wildlife.

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5 Teaching and Learning Activities

5.1 Course Structure

- Lectures
  - Lecture periods will comprise presentations by the instructor. Students will engage in course material through discussion, analysis of specific cases, demonstrations, discussions of the scientific basis of biological applications based on the primary literature and field experience.
- Labs
  - There are three labs in this course, which are complementary and will help to reinforce concepts discussed in lecture. All labs will involve the use of cadavers: specifically, wildlife specimens that were admitted to a wildlife rehabilitation centre and were humanely euthanized due to severe illness or injury and could not be released, or died either before admission or during rehabilitation. No animals were euthanized specifically for this course. Students will work in groups of 2 - 3. In one lab, students will perform a necropsy of an animal and identify major organs in the body and compare with other species. Safe handling of wildlife will be demonstrated. In a second lab, students will practice fracture stabilization in turtles. In the third lab, key triage techniques in mammals and birds in the field to help minimize further injury and suffering to prepare for transfer to a permitted wildlife rehabilitator. These procedures will include fracture stabilization, fluid administration, appropriate thermoregulation, and safe transport mechanisms. Each lab will be 3 hours in length and will have a 30-minute quiz and assessment of applied practical skills.

5.2 Tentative Lab & Lecture Schedule

Week	Date	Topic
1	Jan 11	• Perspectives from wildlife biologists and rehabilitators regarding natural history; anatomy and physiology of turtles in Ontario • Dr. Sue Carstairs, Guest Lecturer
2	Jan 18	• Introduction to Wildlife Rehabilitation • Goals of wildlife rehabilitation • Common terms used in wildlife biology • Common reasons to come across wildlife • Determining if an infant is truly orphaned • Species at Risk in Ontario • Ethical, animal welfare, and economic influences in wildlife rehabilitation • Introduction to comparative anatomy: a systems based approach • Common illnesses and diseases in wildlife seen in rehabilitation centres • Infectious (viral, bacterial, parasitic) • Zoonotic • Toxins • Common injuries • Emerging diseases • Introduction of Assignment
3	Jan 25	• Key physiological differences among mammals, birds, and reptiles • Perspectives from wildlife biologists and rehabilitators regarding natural history; human-wildlife conflict and mitigation techniques; • Myths & realities regarding wolves, coyotes and bears • Guest Lecturer: Mike McIntosh, Bear With Us
4	Feb 1	• LAB #1 – Necropsy ◦ Identification of organ systems ◦ Animal defense ◦ Key physiological & anatomical differences ◦ Quiz at the end of the lab (15 minutes)

5	Feb 8	• Midterm #1 (administered at the start of the class) • Common avian, reptile and mammal species and their natural history – a taxonomic review • Rules/legislation/procedures regarding handling wildlife in Ontario • Acquisition and use of drugs by non-veterinarians and rules pertaining • Capture and handling methods for different species • Guest Lecturer – Dr. Graham Crawshaw
6	Feb 15	• Stabilization techniques, Fluid administration: gavage, subcutaneous ◦ Fluid types and calculations ◦ Fracture stabilization: bandaging, splinting ◦ Appropriate thermoregulation ◦ Wound management ◦ Tail guards • Minimizing Stress, Physical Exam • Euthanasia guidelines
	Feb 19 - 23	WINTER BREAK - NO LABS - NO LECTURES
7	Mar 1	• Lab #2 ◦ Turtle triage and stabilization, field techniques for basic shell stabilization ◦ Basic Turtle Anatomy ◦ Euthanasia guidelines in turtles ◦ Quiz at the end of the lab (15 minutes)
8	March 8	NO CLASS – study time to work on assignment
9	Mar 15	• Midterm #2 • Oil spills and other hazardous, noxious substances and the impact and treatment of wildlife • Nutrition and housing for various species • Temporary housing and release considerations • Ways to mitigate negative impacts from human-wildlife interactions
10	Mar 22	• Lab #3 – Stabilization techniques ◦ Practical application of skills learned: gavage, subcutaneous fluid administration, fracture stabilization, wound management

		◦ Quiz at the end of the lab (15 minutes)
11	Mar 29	• Professional pathways to working with wildlife • Finish any sections we didn't get to earlier in the course • Assignment due – Case-based discussion & presentations
12	Apr 5	• Assignment due – Case-based-discussion & presentations continued • Note: the written component of the assignment is due within 3 days of the oral presentation.

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6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Midterm #1	10.00
Midterm #2	10.00
Assignment	25.00
Lab Quiz #1	5.00
Lab Quiz #2	5.00
Lab Quiz #3	5.00
Final Exam	40.00
Total	100.00

6.2 Assessment Details

Midterm #1 (10.00%)
Date: Thu, Feb 8

- Course Activity:
  - Lectures 1-4 and Lab 1 (all material covered up to and including Feb 1)

Midterm #2 (10.00%)
Date: Thu, Mar 15

- Course Activity:

    - Lectures 1-6 and Labs 1,2

Assignment (25.00%)
Date: Thu, Mar 29 - Thu, Apr 5

- Course Activity:
    - All lectures and labs
    - Weeks 1-11

Lab Quiz #1 (5.00%)
Date: Thu, Feb 1

- Course Activity:
    - Lab #1

Lab Quiz #2 (5.00%)
Date: Thu, Mar 1

- Course Activity:
    - Lab #2

Lab Quiz #3 (5.00%)
Date: Thu, Mar 22

- Course Activity:
    - Lab #3

Final Exam (40.00%)
Date: Wed, Apr 18, 8:30 AM - , 10:30 AM, TBD

- Course Activity:
    - All labs and lectures

6.3 Midterm Exams (10% each)

The midterm exams are based on material up to and including the lecture prior to the midterm exam. Midterm I includes materials from lectures in weeks 1-4 and Midterm II includes material from lectures in weeks 1-6, with emphasis based on lectures and labs from weeks 4-7. The format is short answer and multiple-choice questions.

6.4 Lab Quizzes (5% each)

The lab quizzes comprise 10 multiple choice or short-answer questions intended to assess the knowledge gained from the supporting lecture and subsequent practical lab.

6.5 Assignment (25%)

- Working in groups of ~6, students will choose a pre-identified topic related to sick or

injured native wildlife. A mock-up case will be provided for that topic that includes the species affected, number of animals affected, where the animal was found, time of year, and approximate age of the animal.
- Students will prepare a report (5-7 pages) and give a presentation (15 minute maximum plus 5 minutes for questions) on their case. Specifically, discussion will include the approach to handle, triage and specific actions taken to stabilize the animal. Special considerations based on age, species, location found or other relevant aspects, including but not limited to zoonotic concerns, future mitigation techniques, and human safety will be presented. Evaluation is based on the use of relevant scientific papers (3%); quality (grammar/spelling) (2%); content (10%); presentation and discussion (10%)

6.6 Final Exam (40%)

The final exam consists of short answer and multiple-choice questions based on the entire course content. Part of the exam will be using a case-based approach. Please note that accommodations to the final exam scheduling time will only be made in cases of medical or compassionate (family emergency) situations.

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7 Course Statements

7.1 Policy for Re-grading of Midterm Exams and Assignments

Students who wish to have their midterm exam or assignments re-graded must submit their exam or assignment within 1 week of the return of the midterm exam or assignment. The entire midterm exam or assignment will be re-graded so the mark may go up, down or remain unchanged.

7.2 Grading

If you are absent from classes during the semester, you will be expected to make up missed lecture and laboratory material on your own. Assignments handed in late will be penalized 5% for every day that it is late.

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8 Department of Integrative Biology Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising or Program Counsellors

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops

related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. http://www.learningcommons.uoguelph.ca/
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help and http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. https://www.uoguelph.ca/counselling/
- Student Health Services is located on campus and is available to provide medical attention. https://www.uoguelph.ca/studenthealthservices/clinic
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. http://www.uoguelph.ca/~ksomers/

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9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The regulations and procedures for Academic Consideration are detailed in the Undergraduate Calendar.

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared

responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

9.6 Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

9.7 Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

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