

ZO 350
Wildlife Biodiversity

3 Credits

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Created: 06/01/2011

Revised: 03/06/2020

Approval: 09/06/2020

The Implementation Date for this Outline is 01/09/2019

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ZO 350 Version: 6



Wildlife Biodiversity

Calendar Description

Conserving biodiversity requires primary knowledge of the species present. Students learn to distinguish terrestrial wildlife biodiversity of the Prairie Provinces through the comparison of apparent characteristics, ecological and biological attributes and selected calls. Students develop a pollinator conservation project and learn the survey protocols for selected wildlife species.

Rationale

This is a required course for Conservation and Restoration Ecology (CARE) students that provides knowledge about the wildlife biodiversity in the prairie provinces. Students are able to identify species, and describe their biology & ecology, conservation, taxonomy and natural history providing knowledge that complements employment with conservation, restoration and habitat management. There is special emphasis on the role and conservation of pollinators. Students gain practical experience preparing for and conducting a waterbird and raptor survey.

Prerequisites

None

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. identify and describe the ecology and natural history of selected birds, mammals, reptiles, amphibians and arthropods.
2. identify owls and amphibians by call.
3. list important pollinators and describe pollinator ecology, natural history and conservation.
4. categorize wildlife using current taxonomic nomenclature.
5. describe and conduct visual (waterbirds and raptors) and auditory (amphibian) surveys.
6. research and apply habitat enhancement principles in designing a conservation project.

Essential Employability Skills

Essential employability skills are critical for workplace success and lifelong learning. Lakeland College prepares its graduates for the workplace and lifelong learning by integrating and promoting essential employability skills development in its curricula. Each credit course offered at Lakeland College emphasizes one or more of the following five essential employability skills:

- A. **Communication Skills** that enable individuals to listen, interpret, express, and convey knowledge and ideas so that they are received and understood.
- B. **Teamwork Skills** that enable individuals to respect the thoughts and opinions of others as they work together to plan activities, meet deadlines, complete projects, and contribute to an organization's goals.
- C. **Critical Thinking Skills** that enable individuals to conceptualize and analyze issues from various perspectives while rationally evaluating the strengths and limitations of each perspective and deciding what action to take.
- D. **Adaptability Skills** that enable individuals to respond quickly, willingly, and positively to new conditions and changing times.
- E. **Positive Attitude and Behavioural Skills** that enable individuals to be confident about themselves and to deal with people, problems, and situations with honesty, integrity, and personal ethics.

Resource Materials

Required:

Students require *current* identification guides for the identification of the birds, mammals, amphibians and reptiles of Canada. Field guides, apps for a mobile device, or web sites assist learning identification and are commonly carried by field technicians. The benefit of a guide book is that the batteries won't fail, but the benefits of the apps and websites is that they include updates and sounds/songs

Required Reference(s):

1) Students require the **class notes** booklet that is provided in class at cost recovery for printing of the material.

2) Ducks Unlimited. Waterfowl ID.

<http://www.ducks.org/hunting/waterfowl-id/>

3) D. Lisa Takats, D.L., C.M. Francis, G.L. Holroyd, J.R. Duncan, K.M. Mazur, R.J. Cannings, W. Harris, D. Holt. 2001. Guidelines for Nocturnal Owl Monitoring in North America. Beaverhill Bird Observatory and Bird Studies Canada. Edmonton, Alberta. 32 pp.

<https://www.bsc-eoc.org/download/owlguidelines.pdf>

4) Hawk Migration Association of North America (An excellent 2 page raptor silhouette guide)

http://www.hmana.org/wp-content/uploads/2013/08/HMANA_Hawks_Guide_09.pdf

5) Alberta Conservation Association. Amphibians of Alberta.

<https://www.ab-conservation.com/avamp/identification-keys/juvenile-and-adult-amphibians-of-alberta/>

6) Alberta Conservation Association. Reptiles of Alberta.

https://www.ab-conservation.com/downloads/avamp/aca_reptiles_of_alberta.pdf

7) NatureNorth. Amphibians of Manitoba. (This site has the calls of all our amphibians except the western toad).

<http://naturenorth.com/1np/Species/amphibian/1Spec-am.html>

Recommended Text(s):

1) Naughton, D. 2012. The Natural History of Canadian Mammals. Canadian Museum of Nature.

Recommended Websites:

1) The Cornell Lab of Ornithology. All About Birds. (Much of the textual content for birds is from this site).

<https://www.allaboutbirds.org/>

2) Nature Canada. Guide to Common Canadian Owls and Their Sounds.

<https://naturecanada.ca/news/blog/whos-there-identifying-owl-calls/>

3) Insects of Alberta.

<http://www.insectsofalberta.com/main.htm>

4) The Xerces Society. Pollinator Conservation Resources Centre.

<https://xerces.org/pollinator-resource-center>

5) Alberta Conservation Association. Alberta Volunteer Amphibian Monitoring Program.

(Submit citizen science submissions on sightings of herptiles and hibernacula)

<https://www.ab-conservation.com/avamp/overview/>

6) Canadian Herpetological Society. Amphibians and Reptiles of Canada.

<http://www.canadianherpetology.ca/species/index.html>

7) NatureWatch. Frogwatch. (Report amphibian sightings)

<https://www.naturewatch.ca/frogwatch/>

Recommended Apps:

1) Audubon Bird Guide App (free)

<https://www.audubon.org/app>

2) NatureTracking. iTrackWildlife (Will be useful for snowtracking in ZO245 next semester)

<http://www.naturetracking.com/itrack-wildlife/>

Conduct of Course

Classroom lectures and labs include identification, ecology and natural history and identification reviews. Labs also include excursions outdoors (students are required to bring appropriate clothing for the weather) to practice survey techniques, while other labs may be used for student research, student presentations, and guest speakers as time permits. The college provides binoculars and spotting scopes for student use during field labs, but students are encouraged to bring their own if preferred.

Identification quizzes follow each unit/group of animals during the lecture. The final exam is inclusive of all material covered in the class, so it is important that students stay current throughout the semester. The conservation project is a group project that requires substantial time commitment from all group members and is due near the end of the semester.

Evaluation Procedures

Identification and natural history quizzes follow each of the major groups of animals (see list below), but may also include species covered in previous sections. The bird survey and conservation research project are each a group project. The conservation project requires extensive library and online research and public presentation of this research. The Final Exam is split into two sections: 1) visual identification of species from photographs, and 2) questions that cover all material (e.g. natural history, ecology, survey techniques, ranges, status, etc.). Quizzes and exams cannot be missed without an adequate and documented excuse or a mark of 0 or an incomplete grade is assessed. Late assignments are penalized -25% per day. As per the Environmental Sciences policy, attendance is recorded and students with excessive unexcused absences are required to withdraw from the course.

The final mark is calculated using the following breakdown:

Quizzes = 35%:

- Quiz 1 (5%): Waterbirds
- Quiz 2 (5%): Raptors & Upland birds
- Quiz 3 (5%): Owl Hoots
- Quiz 4 (5%): Songbirds and Remaining birds
- Quiz 5 (5%): Mammals and their Tracks
- Quiz 6 (5%): Reptiles & Amphibians
- Quiz 7 (5%): Amphibian Croaks

Assignments = 30%:

- 1) Bird Survey (5%)
- 2) Pollinator Conservation Project (25%)

Final Exam = 35%:

Final Exam Part 1 (15%): Visual identification (from slides) of Birds, Mammals, Amphibians, Reptiles, Arthropods, & Mammal tracks, and auditory identification of Owls and Anurans.
 Final Exam Part 2 (20%): Biology, Ecology, Natural History, Behaviour, Taxonomy, Conservation and Survey Techniques (multiple choice, short answer & matching questions)

Knowledge/Skills Matrix

Students apply and demonstrate their knowledge and skills to use

A. Communication Skills

A1. by listening, reading, interpreting information, and communicating effectively	
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
A2. by using written, spoken, and/or visual formats and media to communicate and meet	
	needs of each particular audience
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
A3. by using libraries, Internet, technical publications, journals and other sources to find	
	pertinent information
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam

B. Teamwork Skills

B1. by using interpersonal skills to create an atmosphere that maximizes the strengths of
group members to accomplish tasks
Evaluation(s)/Goal(s): Lecture Units 1-6, Labs 1-4, Group Assignments
B2. by using interpersonal skills to resolve conflict, relate to others, and assist others
Evaluation(s)/Goal(s): Lecture Units 1-6, Labs 1-4, Group Assignments
B3. by contributing and listening to others as group determines realistic objectives,
prioritizes tasks, and identifies resources and timelines
Evaluation(s)/Goal(s): Labs and Assignments
B4. by treating other members of the group open-mindedly and fairly
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
B5. by developing tactics/strategies to accomplish tasks
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam

C. Critical Thinking Skills

C1. by seeing critical thinking as a lifelong process of self-assessment
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
C2. by examining problems closely
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
C3. by examining beliefs, assumptions, and opinions, and weigh them against the facts
Evaluation(s)/Goal(s): N/A
C4. by seeking out the truth
Evaluation(s)/Goal(s): N/A
C5. by finding solutions; make decisions
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
C6. by incorporating new ideas that may not necessarily agree with previous thought on the topic
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
C7. by seeing connections between topics and use knowledge from other disciplines to
enhance reading and learning experiences
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam

D. Adaptability Skills

D1. by working independently or as part of team
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
D2. by carrying out multiple tasks or projects
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
D3. by being innovative and resourceful: identify and suggest alternative ways to get the
job done
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
D4. by being open and respond constructively to change and uncertainty
Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam

E. Positive Attitude and Behavioural Skills

E1. by dealing with people, problems, and situations with honesty, integrity, and personal	
	ethics
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
E2. by showing interest, initiative, and effort	
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
E3. by affirming the need for positive solutions and encourage positive interaction and	
	feedback
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam
E4. by balancing personal and family activities with job-related activities	
	Evaluation(s)/Goal(s): Lecture Units 1-6, Outcomes 1-6, Assignments 1-4, Quizzes 1-7, Final Exam

Grade Equivalents and Course Pass Requirements

A minimum grade of D (50%) (1.00) is required to pass this course.

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.

Attendance

Classroom and laboratory attendance is considered vital to the learning process and as significant to the students' evaluation as examinations and reports, therefore absenteeism is recorded.

- a. Students having a combination of excused and/or unexcused absence of 20 percent or higher for the scheduled course hours can be required to withdraw and would then automatically receive a "RW" (required withdrawal) for the course, regardless of any other evaluation results. (RW is a failing grade).
- b. An excused absence is one that is verified with your instructor. Verification should be prior to the absence or the next class day following the absence. Verification of the absence may take the form of a note from your doctor/College nurse regarding illness, or a note from another instructor regarding a field trip or other activity, or authorization by your instructor following an in-person meeting. Be sure to contact your instructor and ask what they will require from you as verification for each absence. An unexcused absence is anything NOT verified by the instructor prior to the absence or the next class day following the absence.

NOTE: Any exceptions to the above attendance policy (e.g. timetable conflicts, work-related issues) must be approved in writing by the Department Chair prior to the beginning of the course.

It is the students' responsibility to know their own absentee record.

Normal hours are 8:30 a.m. to 6:30 p.m., with potential for evening courses, exams or extended field trips. Students are expected to be available for classes during these times.

Course Units/Topics

Lecture Units

Basic notes on the phylogeny and ecology of each Class/Phylum are presented at the beginning of the representative sections, while the identification and ecology of each species are covered individually but grouped by Order, Family, or commonly recognized groupings. The following list may be modified at any time to accommodate new subject-related learning opportunities.

1. Biodiversity and Taxonomy Overview

- i. National and local biodiversity overview
- ii. Taxonomy

2. Class Aves

- i. The ecology and natural history of birds
- ii. Hints for identifying birds
- iii. Waterbirds
- iv. Birds of prey
- v. Upland birds
- vi. Songbirds
- vii. Woodpeckers
- viii. Hummingbirds
- ix. Swifts
- x. Pigeons
- xi. Cuckoos
- xii. Goatsuckers

3. Class Mammalia

- i. The ecology and natural history of mammals
- ii. Hints for identifying mammals
- iii. Herbivores
- iv. Carnivores
- v. Bats
- vi. Rabbits, hares and pika
- vii. Rodents
- viii. Mammal tracks

4. Class Amphibia

- i. The ecology and natural history of amphibians
- ii. Frog and Toad ID and calls
- iii. Salamanders

5. Class Reptilia

- i. The ecology and natural history of reptiles
- ii. Turtles
- iii. Snakes
- iv. Lizards

6. Phylum Arthropoda (tentative - dependent upon time availability)

- i. The ecology and natural history of insects
- ii. Butterflies and moths
- iii. Beetles
- iv. Ants, wasps, bees and allies
- v. Flies
- vi. Lacewings and ant lions
- vii. Sucking bugs
- viii. Grigs
- ix. Stoneflies
- x. Cockroaches
- xi. Dragonflies and damselflies
- xii. Springtails

- xiii. Mayflies
- xiv. True bugs
- xv. Caddisflies

Lab Units

This list may be modified or adjusted to accommodate new learning opportunities and/or because of time or other constraints.

1. **Bird Identification:** Field excursion to prepare students with the skills necessary for the Bird Survey lab.
2. **Bird Survey:** *A field trip to identify migrating and resident birds using binoculars and spotting-scopes. The data is entered into a AEP FWMIS database file. Students must review waterfowl and raptor ID prior to this activity and find a bird identification app or book as a useful reference during the survey.*
3. **Wildlife Surveys & Mammal Surveys:** *An overview of some of the common techniques and reporting options for wildlife surveys.*
4. **Pollinator Conservation Project:** *A group project conducting research and designing a pollinator conservation initiative with production of a presentation summarizing the project. This project encompasses multiple lab periods*



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