Faculty of Science Course Syllabus | Environmental Science Program

ENVS 2500 Field Methods in Environmental Science
Fall 2018

Instructor: Dr. Amy Mui | amy.mui@dal.ca | LSC 813 | 902-494-4197 (office)
Teaching assistants:
Julia Baak (jl748795@dal.ca)
Cody Walter (cd659317@dal.ca)
Simone Charron (Simone.Charron@Dal.ca)

Laboratories: Fridays 9:35am – 12:25pm
Location: Biology Lab B2102
Course website: online access through Brightspace

Course Description:
This course offers a field and lab-based immersion into environmental sampling and analytical methods including both abiotic and biotic components of ecosystems. Scheduled during the fall academic term, students gain skills in wildlife species identification and surveying, and sampling methods for components such as air, sound, and soil. GPS (global positioning system) units and geographic information systems (GIS) are utilized in sampling design, collection, and visualization of results.

Prerequisites: ENVS 1100.03 and ENVS 1200.03, or equivalent and open only to students in the BSc or BA Environmental Science Programs

Objectives / Learning Outcomes:
Students will;
- Develop skills in visual and auditory identification of Atlantic Canada birds, reptiles and amphibians
- Apply basic field techniques to survey wildlife, and assess soil, air, and noise
- Utilize GPS and basic GIS tools to incorporate a spatial dimension into sampling activities
- Gain experience utilizing a range of sampling and surveying equipment used in the environmental sciences
- Experiment with visualization techniques appropriate for environmental field data

Course Materials:
- Students are required to purchase an all-weather field notebook. They are available at the Dal Bookstore at a reasonable cost (~$7.50), or you may use your own.
- There is no required textbook but associated readings will be posted
- Ensure you have appropriate outerwear for comfortably conducting field work in variable weather conditions
- Field equipment directly related to sampling and field collection will be provided
- A limited number of field guides will be provided, but if you have an interest you can purchase them at reasonable cost. Online resources are also available. The following (or similar) guides will be used in this course;
  - Birds of Eastern Canada (D.M. Bird, 2013)
Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America (Powell, Conant & Collins, 2016)

- Digital apps (accessible via mobile phones or desktop web browsers) are also utilized in this course and include: Merlin app (Cornell Lab) and Cram app (digital flash cards)

Field Excursions:
- There are several on and off-campus field visits that are a part of this course.
- We are at the mercy of Atlantic region weather; however excursions will go ahead as planned unless there is an extreme weather warning. In the event the weather prevents us from leaving campus the schedule will need to be re-arranged where possible, or an alternate indoor exercise will be planned instead.
- Field safety is of critical importance, regardless of how far from campus we may venture. All students are expected to behave in a responsible and safe manner and to ensure that field equipment is used appropriately and well-maintained. **If you have any health or mobility-related issues that may affect your safety in the field, you must inform me well in advance of the first field trip.**

### Course Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wildlife Sampling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Plant &amp; Animal ID Quizzes</td>
<td>15</td>
<td>Ongoing / Weekly</td>
</tr>
<tr>
<td>- Biological Inventory lab report</td>
<td>15</td>
<td>Wed Oct 11, 2018</td>
</tr>
<tr>
<td><strong>Soil Sampling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Soil Organic Matter and pH lab report</td>
<td>20</td>
<td>Thurs Nov 1, 2018</td>
</tr>
<tr>
<td><strong>Air-Sound Monitoring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Air Quality &amp; Noise Level lab report</td>
<td>20</td>
<td>Wed Nov 28, 2018</td>
</tr>
<tr>
<td>Participation &amp; Equipment Care</td>
<td>5</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
<td>Exam period</td>
</tr>
</tbody>
</table>

**Wildlife Sampling Module**

This session focuses on the biotic components of the environment, namely avian (bird) and herpetofaunal (reptile and amphibian) assemblages found in the Atlantic Canada region. It is aimed at building practical skills in species identification and developing general knowledge of species life history, importance, and conservation status. Field exercises in transect sampling and use of non-destructive sampling techniques will be applied (pending resource and permit approval). Additionally, students will participate in the campus BioBlitz and assist experts in species identification and data management.

**Quizzes:** Species Identification skills are assessed via weekly 1% quizzes to test your knowledge on common, invasive, and threatened species known to the Halifax region. This is an intensive introduction to species identification. Ongoing exercises will be provided to support retention and expansion of these skills.

**Soil Sampling Module**

Students will assess soil characteristics such as organic matter content, texture, particle composition, nutrients, and pH. On and off-campus soil samples will be collected and brought back to the lab for analysis over the course of a few weeks. GPS units will be used to record the physical locations of each sample.
Air-Noise Monitoring Module
Air quality and noise levels are important metrics for assessing environmental as well as human health. Students will use portable instruments for recording noise and/or air quality both indoors and outdoors and analyze results within the framework of existing environmental health standards. Sound level meters within the range of human hearing will be utilized to assess noise pollution at select sites in the Halifax Regional Municipality.

Participation & Equipment Care
The expectation is that every student will participate in each of the field sessions and contribute to the care, maintenance, and careful use of field equipment. Students will be assessed on their attendance, willingness to participate, and to contribute positively to the collective.

Final Exam
A final exam worth 25% of the final grade will be written during the scheduled exam period. All course content may be included in the exam.

Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 7 Fr</td>
<td>Welcome to ENVS2500</td>
<td>LSC Biology Lab 2102</td>
</tr>
<tr>
<td></td>
<td>Certification Test: <em>Care and Use of Wildlife</em> Binoculars 101 &amp; Campus Biodiversity Exploration</td>
<td></td>
</tr>
<tr>
<td>14 Fr</td>
<td>Wildlife Sampling: Herpetological Survey</td>
<td>Frog Pond Park+</td>
</tr>
<tr>
<td>21 Fr</td>
<td>Wildlife Sampling: Campus BioBlitz</td>
<td>Studley Campus</td>
</tr>
<tr>
<td>28 Fr</td>
<td>Wildlife Sampling: BioBlitz Data Management</td>
<td>Biology Lab 2102</td>
</tr>
<tr>
<td>Oct 5 Fr</td>
<td>Wildlife Sampling: Avian Point Count Survey</td>
<td>Point Pleasant Park</td>
</tr>
<tr>
<td>12 Fr</td>
<td>Soil Sampling: Soils Sampling &amp; Equipment</td>
<td>Studley Campus</td>
</tr>
<tr>
<td>19 Fr</td>
<td>Soil Sampling: Lab Analysis I</td>
<td>Biology Lab 2102</td>
</tr>
<tr>
<td>26 Fr</td>
<td>Soil Sampling: Lab Analysis II</td>
<td>Biology Lab 2102</td>
</tr>
<tr>
<td>Nov 2 Fr</td>
<td>Intro to Air-Sound Monitoring (Dr. Daniel Rainham) Equipment Demonstration</td>
<td>LSC Biology 2102</td>
</tr>
<tr>
<td>7 Fr</td>
<td>Air-Sound Monitoring: Field Sampling</td>
<td>Downtown</td>
</tr>
<tr>
<td>16 Fr</td>
<td>Fall Study Break (NO CLASS)</td>
<td></td>
</tr>
<tr>
<td>23 Fr</td>
<td>Air-Sound Monitoring: Data analysis</td>
<td>LSC Biology 2102</td>
</tr>
<tr>
<td>30 Fr</td>
<td>Course review &amp; Sample Exam Questions</td>
<td>LSC Biology 2102</td>
</tr>
<tr>
<td>Dec 6-16</td>
<td>Exam Period</td>
<td></td>
</tr>
</tbody>
</table>

*All students must write and pass the certification to be able to participate in field activities. Materials will be posted on Brightspace in mid-August and a representative from the Dalhousie Animal Ethics Committee will give a brief presentation prior to writing the certification test.

+ transportation will be provided for this excursion
IMPORTANT NOTES:

- Attendance is a requirement and expectation for success in this course.
- This schedule is tentative and may change slightly depending on weather, equipment, and access to field sites. Any amendments will be posted on Brightspace.
- All course materials and important announcements will be posted on Brightspace - please login to the site regularly.
- Important dates such as the last day to drop courses can be viewed here: https://www.dal.ca/academics/important_dates.html
- Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale:
  
<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>90-100</td>
</tr>
<tr>
<td>A</td>
<td>85-89</td>
</tr>
<tr>
<td>A-</td>
<td>80-84</td>
</tr>
<tr>
<td>B+</td>
<td>77-79</td>
</tr>
<tr>
<td>B</td>
<td>73-76</td>
</tr>
<tr>
<td>B-</td>
<td>70-72</td>
</tr>
<tr>
<td>C+</td>
<td>65-69</td>
</tr>
<tr>
<td>C</td>
<td>60-64</td>
</tr>
<tr>
<td>C-</td>
<td>55-59</td>
</tr>
<tr>
<td>D</td>
<td>50-54</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>

Course Policies

**Class culture:** We aim to cultivate a culture of mutual respect, inclusiveness, and collective curiosity. Students should arrive to class on time and not engage with materials that are outside of the course. Be courteous of your neighbours and use class time to focus on course materials to ensure your success.

**Missed classes:** All of the information related to the logistical and administrative components of this course will be communicated in the lectures. If you miss any part of a lecture, it is your responsibility to make contact with a fellow student and catch up on what you missed, regardless of whether the absence was justified or not.

**Late penalties:** There are 5 assignments in total covering environmental informatics-related subjects. Assignments handed in on the due date will be evaluated at 100% of their potential score. Late assignments will be subject to a late penalty of 25% per day (including weekends). Assignments submitted four calendar days past the due date will be assigned a zero. Assignments handed in AFTER the work has been returned to the class cannot be marked for credit.

**Documentation:** Documentation is required to substantiate illness and emergency. In the case of illness a doctor’s note is required. In the case of other emergencies please speak with Dr. Sue Gass (susan.gass@dal.ca or 902-494-4530) or Dr. Amy Mui (amy.mui@dal.ca or 902-494-4197) about appropriate documentation (for example, a funeral program in the case of a death in the family). All documentation MUST be submitted to Dawn Hall in the Environmental Science main office.

**Plagiarism:** Plagiarism and cheating is a serious academic offense and includes the submission or presentation of the work of another as if it were one’s own. Failure to acknowledge someone else’s words, phrases, ideas, recording, images, code, results, lecture content, term paper, or assignment responses may result in a failing grade or, if very serious, suspension or expulsion from the university. Please visit https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html for more information.
University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity
At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.
Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility
The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).
Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct
Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don’t follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can’t be reached, or would be inappropriate, procedures exist for formal dispute resolution.

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. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness
Statement: http://www.dal.ca/cultureofrespect.html

Recognition of Mi’kmaq Territory
Dalhousie University would like to acknowledge that the University is on Traditional 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 (1321 Edward St) (elders@dal.ca).
Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates (add/drop): https://www.dal.ca/academics/important_dates.html

University Grading Practices:
https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html
Student Resources and Support

Advising
General Advising: https://www.dal.ca/campus_life/academic-support/advising.html
Science Program Advisors:
  https://www.dal.ca/faculty/science/current-students/academic-advising.html
Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
Black Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports
Library: https://libraries.dal.ca/
Writing Centre:
  https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
Studying for Success:
  https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
Copyright Office: https://libraries.dal.ca/services/copyright-office.html

Other supports and services
Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html
Student Advocacy: https://dsu.ca/dsas

Safety
Research Lab Safety:
Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html
Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html
Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program:
https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html