

School of Environment, Resources and Sustainability  
Faculty of Environment  
University of Waterloo  
**ERS 340: Ecosystem Assessment - Spring 2020**

**Instructor:**

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**TA:**

TBD

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NOTE: Although this is a field course, students are expected to undertake fieldwork individually, maintaining physical distance from others, during this current global crisis.

**Course Location:** *Virtual classroom and appropriate outdoor locations. Pre-class surveys will be used to collect information about students' time zones, which will be used to determine the optimal synchronous lecture time.*

**Course Dates:** The course formally runs the entire spring term – however, the bulk of the course (field skills) occurs during the block period of May 11 - 29, 2020 (excluding Victoria Day). A detailed calendar will be posted to LEARN prior to the course.

**Course Description:** Today's environmental practitioner requires a comprehensive skill set of advanced environmental assessment techniques. In ERS 340, students will be trained by in-field professionals in aquatic and terrestrial ecology to become independent environmental technicians. Students will benefit from interactions with guest presenters and have other networking opportunities during the course. You will be expected to take part in long days in both online and outdoor environments. The course will be delivered through online classes and a combination of online and outdoor exercises (conducted individually with precautions to maintain physical distance as per health guidelines).

**Additional Course Fee:** There are no fees in addition to the normal per course fees. After the course, students may opt to apply for relevant certifications and pay for certification tests.

**Intended Learning Outcomes:**

1. Develop advanced skills in the collection, identification and analysis of environmental data through the participation in field activities
2. Acquire professional certification(s) in provincially recognized assessment protocols.
3. Learn to expertly record and manage environmental data.
4. Practice networking skills while meeting professional environmental practitioners.

**Certification Courses (need to pass in-course test to be certified):**

- Ontario Benthic Biomonitoring Network (OBBN)

**Other Recognized Certificates and Skills**

- Vegetation Sampling Protocol (VSP)
- Pollinator Training
- Advanced Plant Identification Training
- Advanced Bird Identification and Monitoring
- Ontario Pesticides Use
- Tree Marking (Forestry Management)

**Required Textbooks:**

*Shrubs of Ontario* - Available as courseware from campus bookstore

*Trees of Canada* – You can either buy your own copy (it is good idea to have a personal copy of this book) or you can sign one out from the Ecology Lab (limited numbers)

*Newcomb's Wildflower Guide* - You can either buy your own copy (it is good idea to have a personal copy of this book) or you can sign one out from the Ecology Lab (limited numbers)

**Required Gear:**

Students will be given instructions on how to make use of locally available resources to replace specialized gear (e.g. DBH tapes, clinometers, quadrats). Students are expected to have some sort of measurement device – a measuring tape or a string and ruler.

**Course Process:**

The Province mandates that this course is open during the entire term. However, the major portion of this course will run from May 11<sup>th</sup>, 2020 - May 29<sup>th</sup>, 2020.

Students must fill out the following forms and hand them into the instructor on **May 11<sup>th</sup>** during our safety training: (these forms will be posted on LEARN)

1. **UW ACKNOWLEDGEMENT OF RISK AND RESPONSIBILITY FORM**  
[https://uwaterloo.ca/safety-office/sites/ca.safetyoffice/files/uploads/files/risk\\_responsibility08\\_0.pdf](https://uwaterloo.ca/safety-office/sites/ca.safetyoffice/files/uploads/files/risk_responsibility08_0.pdf)
2. **UW EMERGENCY INFORMATION FORM.**  
[https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/emergency\\_information\\_form.pdf](https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/emergency_information_form.pdf)
3. **FACULTY OF ENVIRONMENT FIELD TRIP FORM**  
[https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/field\\_trip\\_form\\_111213\\_2.pdf](https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/field_trip_form_111213_2.pdf)

**Course Calendar:**

*\*Based on best available information, may be subject to minor changes before the start of the course.*

<b>Calendar Date</b>	<b>Topic Covered</b>	<b>Resources Used</b>
<b>Week 1</b>		
May 11	General Introduction Safety and Field Notes	Presentation Slides Nature apps
May 12	Bird ID and Monitoring	Shrubs of Ontario
May 13	Plant and Trees ID	Trees of Canada
May 14	Pollinator Habitats	Newcomb's Wildflower
May 15	Environmental Monitoring Protocols for Birds, Plants, Trees, and Pollinator Habitats	Guide textbooks
<b>Week 2</b>		
May 19	Ontario Pesticides	Guest lecturer Dianne Watkins
May 20	Vegetation Sampling Protocol (VSP)	Will be provided by guest speaker Danijela Puric- Mladenovic
May 21	VSP	
May 22	VSP	
<b>Week 3</b>		
May 25	Ontario Benthics Biomonitoring Network (OBBN) Training	OBBN Manual  OBBN Presentation and ID Slides prepared by Ecology Lab
May 26	OBBN	
May 27	OBBN	
May 28	OBBN	
May 29	Review	
<b>Remainder of Term</b>		
Individual Assignment	Experiential Learning Outcomes Reflection	Experiences documented through the first three weeks
Group Assignment	Creative Project on Ecological Topic of Choice	Course material, experiences and observations documented during course, academic and non-academic source material

### Additional Course Information:

Field skills are physically demanding and will include long days. You will be required to go outside in all weather conditions. A few required supplies are listed below:

- Backpack to carry everything in the field
- Field books listed above
- Binoculars (if you have them)
- Book for field notes (Rite in the Rain is best), pens and pencils
- Boots for wet and muddy areas
- Good socks (wool are best)
- Water bottle
- Insect repellent/ bug jacket
- Clothing: hat(s), sunglasses, good field clothes (canyass or similar pants with zip off legs are good), clothes that are neutral rather than blue are best (blue tends to attract insects), long sleeved shirts, rain gear, a good pair of hiking boots with ankle support
- Sunscreen (SPF 30 at least)
- It is a good idea to bring a personal first aid kit (band-aids, polysporin)
- Snacks and lunch for each day of field work
- Warm jackets for cooler weather
- Rain Pants
- Waterproof jackets
- Extra clothing to change into if you get wet

### Course Evaluation

Section A: Quizzes/Certifications *	Due Date	Percentage of Final Grade
Bird ID and call Quiz	May 15 <sup>th</sup> , 2020	5%
Plant ID Quiz	May 15 <sup>th</sup> , 2020	5%
Tree ID and Tree Marking Quiz	May 15 <sup>th</sup> , 2020	5%
OBBN: Benthic ID and Manual Quiz	May 22 <sup>nd</sup> , 2020	5%
Pesticides Quiz	May 29 <sup>th</sup> , 2020	5%
Section B: Assignments	Due Date	Percentage of Final Grade
Bird Monitoring Field Sheet	May 18 <sup>th</sup> , 2020	5%
Pollinator Summary and Opinion	May 18 <sup>th</sup> , 2020	5%
OBBN Data Analysis	June 5 <sup>th</sup> , 2020	5%
Tree Marking Summary and Opinion	June 3 <sup>rd</sup> , 2020	5%
Plant Sampling Data Sheets	May 26 <sup>th</sup> , 2020	5%
Field Notebook	May 29 <sup>th</sup> , 2020	15%
Experiential Learning Outcomes Assignment (Individual)	July 30 <sup>th</sup> , 2020	10%
Term Project (Group)	July 24 <sup>th</sup> , 2020	15%

Section C: General	Due Date	Percentage of Final Grade
Participation, Professionalism, and Attendance	Throughout course	10%

**\*Students will be required to complete and pass all exercises and practical exams as set by the instructors. The due dates are subject to change but will be finalized before the beginning of the course on May 11<sup>th</sup>, 2020.**

### **Field Notebook – (15%)**

#### **Due Date:**

Field Notebook Due May 29<sup>th</sup>, 2020 (Due by Midnight on LEARN)

Each student is required to create and maintain a comprehensive set of field notes, which will be submitted at the end of the field component of the course. Field notes should include data on weather conditions, geographic locations, dates, environmental data collected and any observation or any ideas that you feel are important (you will learn more on what is to be included during the first day of class). Field Notes will be marked on their comprehensiveness and effectiveness. Notes are to be submitted in a digital format (ex. by jpg, pdf) on LEARN by midnight.

Late submissions will not be accepted. Any entry received after midnight on the due date will receive a zero grade. *It is recommended you keep a daily log in order to maintain efficiency of this exercise. No extensions will be granted.*

### **Data Sheets and Data Entry (5% each (total of 10%))**

#### **Due Dates (Due by Midnight on LEARN):**

Bird Monitoring Field Notes and Data Sheet: May 18<sup>th</sup>, 2020

VSP Field Notes and Data Sheets: May 26<sup>th</sup>, 2020

#### **\* A list of all Data Sheets that are required will be supplied.**

Students will be collecting and entering data for various portions of the course. Each student is required to create and maintain a comprehensive set of field notes (including data sheets for Bird Monitoring and VSP). Field notes should include information on data analysis, results, and methodology and any other pertinent information should also be recorded. Data logs will be provided for some course components. Field notes will be marked on their comprehensiveness, accuracy and clarity. It is vital that you use Latin species names at all times and write out all species names in full.

### **Summary/Opinion and Data Analysis (5% each (total of 15%))**

#### **Due Dates (Due by Midnight on LEARN):**

Pollinator Summary and Opinion: May 18<sup>th</sup>, 2020

Tree Marking Summary and Opinion: June 3<sup>rd</sup>, 2020

OBBN Data Analysis: June 5<sup>th</sup>, 2020

Based on observations and readings, students will provide a summary and opinion of pollinators and their habitats, and Ontario's forestry management tree marking strategy. For the OBBN data analysis, students will be provided with previous years' benthic data to analyze and report findings. A marking rubric will be provided during the course.

### **Participation, Professionalism and Attendance (10% of mark)**

On an individual and group basis (when applicable), you will be assessed on the general quality of your fieldwork and data entry. It is expected that you will be on time and prepared each day. Further, it is expected that data will be gathered with reasonable efficiency and organization; accurate, legible, and neat, per desired formats, and kept in good order. Conduct on the site is also important (e.g., minimizing disturbance to the environment, keeping equipment in good order and acting in a professional manner).

Curiosity is encouraged, along with good observations: appreciation will be shown for such additional contributions. Naturally, I will make allowance for your need to learn through experience and there will not be unreasonable expectations. Be conscientious and try your best. Curiosity can be demonstrated in notes and comments on the data sheets.

Don't be afraid to ask questions. I encourage them. If unsure or confused – ask! Don't be shy: our paramount rule as instructors is that students must always be treated with respect and every question is welcomed without judgment. If you notice something interesting or curious, think about it and mention it to the instructor or your colleagues. Your observations can prove valuable. If you have an idea for improving fieldwork procedures or operations – propose it.

\*It is your responsibility to schedule any Co-op interviews *around* scheduled class time.

### **Individual Experiential Learning (10% of mark)**

**Due: July 30<sup>th</sup>, 2020 (Due by Midnight on LEARN):**

You will be assessed on your general experience in our learning community. For this assignment, you will submit (max 2 pages single spaced) a reflection on your learning outcomes. Learning outcomes can be varied, from the methods and techniques you have learned, experiences in the field, working in teams, coming to appreciate nature, learning to observe, etc. Some students in the past have had quite transformative experiences.

### **Group Creative Final Assignment (15% of mark)**

**Due: July 24<sup>th</sup>, 2020 (Due by Midnight on LEARN):**

Throughout the course, there will be several lectures, various training programs and specific skill development on various aspects of ecosystem assessment. You will be given the opportunity to undertake an interesting assignment to demonstrate the knowledge you have gained from the course. The course instructor will review the assignment expectations on the first day of class (May 11<sup>th</sup>, 2020). Use your course notes,

bibliography, library resources, scientific journals, Web sites and your own experiences. Make sure to acknowledge your sources of information and assistance; usual UW policy applies. The assignment is due by **Midnight on July 24<sup>th</sup>, 2020 on LEARN.**

### **Readability and Clarity:**

Students are expected to present well organized, and properly written work. Penalties of up to **25%** may be applied in cases where readability and/or clarity are inadequate.

### **Late Penalties**

All assignments and field notes, are to be submitted online on LEARN and are due at *midnight* on the date indicated. Students are responsible for handing their work in on time. Lab notes and field data sheets are to be handed in by the end of the day. A late penalty of a 10% deduction (off the final grade of the grade item) is given per calendar day (24 hours) up to three days. Following the third day the assignment will be graded as a zero. Only in unavoidable circumstances will extensions be granted, and must be given by the course instructor prior to the due date of the assignment, field notes or data file.

### **Citation Format for Assignments**

The citation format adopted for this course is the APA (American Psychological Association) style. The complete style outline can be found in the Publication Manual of the American Psychological Association, located in the reference section in Dana Porter Library, call number BF76.7.P83 1994.

Online you can find some quick references at the following URLs:

APA essentials - [http://www.vanguard.edu/faculty/ddegelman/index.aspx?doc\\_id=796](http://www.vanguard.edu/faculty/ddegelman/index.aspx?doc_id=796)  
and <http://www.apastyle.org/>

APA Crib Sheet - <http://www.wooster.edu/psychology/apa-crib.html>

Citing Electronic References - <http://www.apa.org/journals/webref.html#Email>

Frequently asked Questions - <http://www.apa.org/journals/faq.html>

### **Policies and Procedures:**

◆ Students with disabilities: AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

◆ Mental Health: The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. Please note that help is available. Mental health is a serious issue for everyone

and can affect your ability to do your best work. Counselling Services <https://uwaterloo.ca/counselling-services/> is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

- ◆ **Provincial Tests:** Students will be expected to follow the rules of the provincial tests. Rules for testing at the University of Waterloo will not apply, nor will accommodations be made during these tests that fall outside the provincial rules.
- ◆ **Religious Observances:** Students need to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.
- ◆ **Unclaimed assignments:** Unclaimed assignments will be retained for one month after term grades become official in quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures.
- ◆ **Communications with Instructor and Teaching Assistants:** All communication with students must be through either the student's University of Waterloo email account or via Learn. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.
- ◆ **Intellectual Property:** Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:
  - Lecture content, spoken and written (and any audio/video recording thereof);
  - Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides); Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.



Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

◆ Academic Integrity: Each student will be asked to read and sign the Academic Integrity form below. We will go over on the first day of the course: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. The University's guiding principles on academic integrity can be found here:

<http://uwaterloo.ca/academicintegrity> ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office specifically for students: <http://uwaterloo.ca/academicintegrity/Students/index.html>

Students are also expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions.

Students who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. Students may also complete the following tutorial: <https://uwaterloo.ca/library/get-assignment-and-research-help/academic-integrity/academic-integrity-tutorial>

When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline: <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>.

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance:

<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70>

Plagiarism: In particular, you should not plagiarize the work of others. Policy 71 defines plagiarism as: "The act of presenting ideas, words or other intellectual property of another as one's own. The use of other people's work must be properly acknowledged in all written material such as...essays, laboratory reports, design projects, statistical data, computer programs and research results. The properly acknowledged use of sources is an accepted and important part of scholarship. Use of such material without complete and unambiguous acknowledgement, however, is an offence under this policy." Students are expected to keep a copy of all materials used to prepare assignments in case of disputed work and should be able to provide working notes and original data for any assignment within 4 hours of this being requested.

In the context of this course, plagiarism includes (among other activities) submitting without appropriate acknowledgement any report (or part thereof, including software, designs, photos, computer images, models, drawings, maps, statistics, samples, results of lab or field work etc.) which has been submitted previously to any course anywhere by any person, submitting a report in which the production has been shared by more than one student and each has submitted it as their own without acknowledgement of the other's contributions, submitting any work created in whole or in part by another

without the usual acknowledgement. Policy 71 states that one should not submit “an essay, report or assignment when a major portion has been previously submitted or is being submitted for another course with the express permission of all the instructors involved”. **If in doubt, ask the course instructors or the teaching assistant if your intended assignment submission is acceptable.**

All suspected academic misconduct are investigated and formally reported to the Associate Dean, Undergraduate of Faculty of Environment.

◆ **Appeals:** A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) <https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72>

◆ **Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 - Student Petitions and Grievances, Section 4, <https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>. When in doubt please contact your Undergraduate Advisor for details. *This form may be used by course instructors as an educational tool to help their students maintain high standards of academic integrity (AI) in their work. Additional copies (as well as a version specifically for programming assignments) are available online at: <https://uwaterloo.ca/academic-integrity/sites/ca.academic-integrity/files/uploads/files/AIAcknowledgementForm.pdf>.*

Students are expected to know what constitutes AI, to avoid committing AI offences, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offence, or who need help in learning how to avoid offences (e.g., plagiarism, cheating) or about 'rules' for group work / collaboration should seek guidance from the course professor, TA, academic advisor, or the Undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to **Policy 71, Student Discipline**, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>

A student who believes that he/she has a ground to appeal a discipline decision should refer to **Policy 72, Student Appeals**, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>

A student who believes that a decision or action of a faculty member has been unfair or unreasonable should refer to **Policy 70, Student Petitions and Grievances**, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>