Biology 3230F
Field Research in Biology

Description: This experiential learning course provides a theoretical and hands-on introduction to the planning and execution of field studies in biology. Course topics include planning, common field methods, data recording, and common methods of data analysis used by field biologists. Each of these will be presented during lectures, and performed by students for credit. A breadth of study organisms and systems will be covered (e.g. trees, herbaceous plants, animals, aquatic ecosystems, terrestrial ecosystems). During September and October, this course **will include several field trips during the lab and lecture timeslots on Tuesdays.** 2 lecture hours, 3 laboratory hours, 0.5 FCE

Pre-requisite(s): A minimum mark of 60% in Biology 1001A or Biology 1201A, and Biology 1002B or Biology 1202B or Integrated Science 1001X, and Biology 2244A/B or Statistical Science 2244A/B.

Statement Regarding the COVID-19 Pandemic: The policies of this course are based on my moral priorities to first, make the class environment safe and second, provide as valuable an educational experience as possible. They are also based on two important constraints: 1) at the time of writing this syllabus, modeling of the pandemic indicates the fourth wave of COVID has started and is increasing, and 2) Western University has planned for face-to-face learning as much as possible. With respect to COVID-19, the most important responsibility that we all bear is to avoid infecting others. This means that if you are experiencing any possible symptoms of COVID, or you are not **completely** comfortable answering "no" to every question on the daily return to campus questionnaire then you should **not** come to class. I promise to use the same caution each day before coming to teach you.

With that in mind, I have tried to develop policies that allow for flexibility with course deadlines and attendance. However, field biology is a hands-on activity, by nature. So, the experiential components of this course (collecting data in the field, analyzing it, and reporting the results) are essential to achieving the learning outcomes – you cannot miss everything and still expect to learn a lot and receive a good grade. If you miss some components of the course because of illness or possible COVID exposure and you feel that you need further support or flexibility from me, please contact me about it. I cannot guarantee that I will grant every request, but I will hear you out, treat you with respect, and do my best to balance our safety needs with the academic integrity of the course.

Finally, I will need to ask for trust and flexibility from you, as well. By now, it should be obvious to all of us that the state of the pandemic changes rapidly and so can policy requirements and directives. All plans, including those laid out in this course outline are potentially subject to change. For example, it is possible that at some point in the term, this class, or some components of it, may need to be completed remotely. We have all experienced this type of disruption before and know that it is not easy. I ask in advance for your patience and understanding should such changes become necessary.

Course Learning Outcomes
At the end of this course, successful students will be able to:

1. Describe and perform the steps of preparing for field studies in biology, including planning the logistics and travel arrangements, researching and obtaining required permits, and considering ethical and safety concerns and taking appropriate steps to avoid or reduce risks or environmental damage and to acquire requisite safety training.
2. Plan and execute an independent field research project, from development of the experimental question or hypothesis to be tested, to design and implementation of the sampling or data acquisition, choosing the appropriate statistical or other analytical methods for the data or samples acquired, presenting the results in graphically and in writing, placing their findings in context of related studies in the scientific literature, and stating the significance of their work to conservation planning and management.
3. Through field exercises, learn to differentiate and identify some of the predominant species of a broad range of organisms in the study area(s) and know common techniques to sample and assess these, as well as important edaphic factors in the environment.
4. Properly record biological observations and data in the field under favourable or inclement conditions.

Instructor: Dr. Ben Rubin, Department of Biology brubin2@uwo.ca
Lectures: Tuesdays and Thursdays at 1:30-2:30 p.m. PAB-117
Labs: Tuesdays from 2:30 p.m. to 5:30 p.m. BGS-3000

No required text.

OWL: Students are responsible for checking the course OWL site (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: http://owl.uwo.ca.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Land Acknowledgement: We acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. This land continues to be home to diverse Indigenous peoples (e.g. First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society.

Tentative Schedule

		Sep 9	Introduction
Sep 14	**Lecture: Introducing iNaturalist and reflective writing** Field Trip 1A: Marking pollinators	Sep 16	R review, data entry and organization
Sep 21	Lecture: R review, data entry and organization Field Trip 1B: Recapturing pollinators and vegetation sampling	Sep 23	Writing a scientific paper
Sep 28	FT1 individual reports due Field trip 2: Crayfish allometry – Medway Creek	Sep 30	Introduction to FT 3 **Project proposals due**
Oct 5	Field trip 3: Forest Structure Medway ESA FT1 group reports due	Oct 7	FT 2 Individual reports due No lecture:Individual meetings to plan research projects
Oct 12	Lecture: Designing datasheets No lab: Individual meetings to plan research projects FT2 Group reports due	Oct 14	Field Safety FT3 Individual reports due
Oct 19	Field trip 4A: Setting out mammal food	Oct 21	No lecture: Individual meetings to plan research projects FT3 Group reports due
Oct 26	Field trip 4B: Measuring remaining food (in lab) Individual meetings to plan research projects	Oct 24	**Field safety forms and data sheets due** No lecture: Individual meetings to plan research projects
Reading Week			
Nov 9	Lecture: Statistics review No lab: Individual meetings / Data collection FT4 Individual reports due	Oct 11	Statistics review **iNaturalist collection due**
Nov 16	Lecture: Statistics review No lab: Individual meetings / Data analysis FT4 Group report due	Nov 18	Statistics review
Nov 23	No lecture or lab Individual meetings / Data analysis	Nov 25	Archiving field data **Draft data analysis due**
Nov 30	Lecture: Field biology jobs & careers No lab: Individual meetings / Data analysis	Dec 2	No lecture: Individual meetings / Data analysis **Reflective writing assignment due**
Dec 7	No lecture or lab **Final paper due**		

Evaluation Scheme:

- Class attendance: 5%*
- Field reports: 4 @ 5% each
- iNaturalist collection 10%
- Reflective writing assignment: 10%
- Individual research projects
  - Project Proposal: 10%
  - Field Data Sheet & Field Safety Form: 10%
  - Draft Data Analysis: 10%
  - Final Project: 25%*

*You must pass this element to pass the course.

Attendance policy: Attendance will be taken at all class meetings.

Experiential data collection activities: There are six data collection activities planned in this course (Listed as field trips 1A, 1B, 2, 3, 4A, and 4B on the schedule). **You are required to participate in at least four of the six and to document any absences.** Acceptable documentation may be through an Academic Counsellor or by using a self-reported absence.

Overall class meetings: To receive full credit for your attendance grade, **you must attend at least 80% of all class meetings**, including the six experiential data collections activities above. To pass the class you must attend 65% of all meetings. No documentation is required for missing meetings that are not included as experiential data collection activities. If you submit documentation for such meetings it will not count as attendance and will have no effect on your grade calculation.

Attendance grade calculations:

Number of experiential data collection activities attended	Proportion of all class meetings attended	Attendance grade (out of 5%)	Are you eligible to pass the course?
6, 5 with absence documented, or 4 with both absences documented	≥ 80%	5	Yes
6, 5 with absence documented, or 4 with both absences documented	≥ 65% but < 80%	2.5	Yes
6, 5 with absence document, or 4 with both absences documented	<65%	N/A	No
5 with absence undocumented or 4 with 1 absence documented	≥ 80%	-5	Yes
5 with absence undocumented or 4 with 1 absence documented	≥ 65% but < 80%	-7.5	Yes

5 with absence undocumented or 4 with 1 absence documented	<65%	N/A	No
4 with two undocumented absences	≥ 80%	-10	Yes
4 with two undocumented absences	≥ 65% but < 80%	-12.5	Yes
4 with two undocumented absences	<65%	N/A	No
< 4	Any	N/A	No

For further information, please consult the university's policy on academic consideration for student absences:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf.

Field Report Policies: Students will work in groups of 3 or 4 during each of the field trip and to analyze and report on the data we collect. Each group project will consist of two reports: an individual report where you will be assigned to write one of the following sections (Introduction, Methods, Results, or Discussion) and a group report based on the group's integration and revision of the original sections.

Grading: In most cases, your grade will be based on the group report. You may request to have me grade your individual report submission instead in which case that grade will replace you group report grade. Your grade may go up, down, or remain the same as a result. Requests to replace the group grade must be made with 7 days from when the group reports are returned. If you do not request that I replace your grade, I will not read your individual report but I will check that it was submitted.

Missed reports: Individual reports are due at 11:55 PM on the date indicated. The following morning, I will check that they are submitted and if your group is missing a section, I will supply you with a substitute draft. The substitute draft will be flawed so that it does require some editing by the group but so that the group does not need to start from scratch. After, I supply your group with a substitute draft, it will be too late to submit the individual report for credit.

If you are unable to submit an individual report on time and you document it with an Academic Counsellor or using an SRA, you will receive no grade for the field report and the extra weight will be allocated to other field reports. If you do not document the missed report, you will receive a grade of zero. **You must submit at least 2 of the 4 reports to pass the class, regardless of documentation.**

Policy for missing other assignments: If you are unable to submit any other course assignment on time, you should document it with an Academic Counsellor or using an SRA, you will receive no grade for the field report and the extra weight will be allocated to other field reports. If you do not document the missed assignment, you will receive a grade of zero. If you use an SRA, you will receive an extension of 72 hours. Unless otherwise specified, assignments are due at 11:55 PM on the dates indicated.

Western's Grading Standards: Click here for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

Accessibility: Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Learning-skills counsellors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo

Academic Offences: Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Acknowledgement of Science Students' Council support: This course is supported by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the chair of the department or email the Science Students' Council at ssc@uwo.ca.