

Biology 3445F – Community Ecology Fall 2017

An integrative approach to ecology, stressing the structure and function of communities. Theoretical explanations for diversity, stability and productivity across a variety of community types are evaluated in light of empirical evidence.

Instructor: Tim Hain, tjhain@uwo.ca, Collip Building Room 209

Class hours: Monday and Wednesday, 12:30-1:30pm, in Kresge 203

Lab hours: Section 002: Thursday 2:30-5:30pm

Section 003: Wednesday 2:30-5:30pm

Section 004: Thursday 9:30am-12:30pm

In BGS 2077, or in a computer lab (location and dates given in the schedule below)

Office hours: Monday and Wednesday, 1:30-2:30pm, Collip 209

Teaching assistants: Carlos Barreto (cbarreto@uwo.ca) and Caitlyn Lyons (clyons33@uwo.ca).

Please direct all your lab-related questions to your assigned TA.

Prerequisites: Biology 2483A/B

Course website:

Students should check OWL (<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.

I encourage students to use the Forums on the OWL site for asking questions that other students might want to ask. For example, if you have a question about an assignment's format or due date, please post it to the forum so that the question needs to be answered only once.

Goals of the Course

Community ecology concerns patterns and processes involving multiple species at one or more locations.

- 1) *To teach you the basic principles of community ecology.* These include theoretical principles applicable to any type of community. A variety of taxonomic groups will be considered. Lectures will provide the necessary information to be able to understand primary research articles. Lectures will be supplemented with readings to demonstrate methodological, applied or theoretical principles in community ecology. Labs will provide hands-on application of community data.
- 2) *To teach you to critically read and evaluate papers from the primary literature.* Assigned readings are from the EEB & Flow blog. Primary literature articles will be posted to aid in writing your final lab report.
- 3) *To improve your data collection and analysis skills.* During the course of completing a research project (labs) you will collect and analyse data. You will learn and be expected to apply several methods of analyses. A previous course in statistics is strongly recommended.
- 4) *To improve your writing skills.* A research project will require you to write a paper in the form of a scientific article. Your ability to write is directly linked to the effort you place on reading scientific articles, as the more you read, the more you understand what is expected of you.

Learning outcomes

Further to the goals of the course above, outcomes for each lecture will be released with the lecture. By the end of this course, you should be able to:

1. Perform fieldwork safely and effectively in stream and field environments, and use equipment commonly employed in environmental/community assessments.
2. Identify locally common plant and invertebrate taxa using a guide.
3. Assess community biodiversity using quantitative measures.
4. Perform a literature review on community ecology topics.
5. Write a lab report in the style of a scientific paper.
6. Answer test questions related to community ecology topics, in both multiple choice and paragraph forms.

Course materials

There is no required textbook for this course. Students are encouraged to read primary literature available on OWL. Assigned reading materials are entries on the community ecology Blog “The EEB & Flow” (<http://evol-eco.blogspot.ca/>). Links to specific entries are provided in the schedule below, and will be announced in class and on OWL. Exam questions will include material from the EEB & Flow blog assigned articles.

Evaluations

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|-------------------------|---|-----|
| Lecture participation | Weekly quizzes (see below) | 5% |
| Lab data collection | Submitted at the end of lab | 5% |
| Midterm I | During class – October 16 | 15% |
| Midterm II | During class – November 13 | 15% |
| Laboratory report | December 4, 2017 by 5pm | 20% |
| | Submit electronically to Turnitin and a paper copy to me in class or to my office | |
| Final exam (cumulative) | To be scheduled by the Registrar’s Office | 40% |

Weekly quizzes

Weekly quizzes will be given as a quiz-style learning tool that will be used to encourage learner-centred progress. Here’s what that means for you: Once a week, classes will start and end with a one question quiz. The question may involve the assigned reading for the lecture. There are no marks associated with the answer, but you are expected to hand in half-sheets at the end of class for your 5% participation mark. Half-sheets will be returned for your study purposes if requested.

Midterms and exam

There are two in-class term exams and a cumulative final exam in this course; all exams are compulsory. Students are responsible for material presented/discussed in lecture and laboratory, as well as material covered by any assigned readings. You can expect the exams to include any or all of the following question types: multiple choice, matching, fill-in-the-blank, short answer and/or essay. Non-programmable calculators are permitted for use during the midterm and final exams. No other aids are allowed. **Cellular phones, iPods, and other similar technology are not permitted in the exam room.** Computer-marked multiple-choice tests and/or exams may be

subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Laboratory

The meeting place for labs is typically in BGS 2077, but for labs with statistical analysis, a computer lab on campus will be used. The location is given in the schedule below. **Be sure to go to the correct location each week.** The final lab report is a **compulsory** component of the course. Late lab reports will be penalized 10% per day or part thereof (including weekends), and will not be accepted more than 4 days late. Missed lab attendance at labs will not be re-weighted to other course components or lab periods. Due to room capacities and equipment restrictions, **you must attend your own lab section.**

Scholastic offences

Scholastic offences are taken seriously and students are directed to read the policy at: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Plagiarism: Students must write their essays and assignments in their own words. You are expected to reference any ideas taken from other authors, using the format found in the journal *Soil Biology & Biochemistry*.

All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software (i.e. TurnItIn) under license to the University for the detection of plagiarism. All papers submitted 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.

Late assignments

Assignments are due at the beginning of class on the due date. Assignments submitted after that time will be penalized 10% per day, and marks more than one week late will receive a mark of 0. You are encouraged to submit all assignments online through the OWL website so that they can be inspected with the plagiarism software and so that the exact time and date of submission is recorded.

Lecture schedule

The lecture topics presented below are tentative and may change as the semester develops. Lecture numbers with a * will have a weekly quiz associated with them.

| Section | Date | Lecture | Topic |
|---|-------------|----------------|--|
| Introduction | Sept. 11 | 1 | Introduction and course organization |
| Section I: How do we study communities? | Sept.13 | 2* | Describing communities: richness, abundance, composition (EEB Jan. 21, 2014) |
| September 13-14 – No labs | | | |
| | Sept 18 | 3 | Experimental design and common statistics: multivariate and ordinations |

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|--|---------|-----|---|
| | Sept 20 | 4* | Common patterns: Intro to SADs, SARs, rank abundance, rarefaction, latitude, altitude (EEB Apr. 17, 2013) |
| Sept 20-21 - Lab 1: Stream Invertebrates I - Sampling | | | |
| | Sept 25 | 5 | SARs: 3 hypotheses |
| | Sept 27 | 6* | Niche vs Neutral: underlying themes (space / environment) and debates (EEB Jun 21, 2017) |
| Sept 27-28 – Lab 2: Stream Invertebrates II - Identification | | | |
| Section II: Community assembly | Oct 2 | 7 | Community assembly: overview, niches: fundamental vs realised |
| | Oct 4 | 8* | Interactions: Competition, Predation, Facilitation (EEB Feb 11, 2013) |
| Oct 4-5 – Lab 3: Stream Invertebrates III – Data Analysis Computer lab: Wednesday PM in HSB 16, Wednesday AM in SSC 1000, Wednesday PM in SSC 1032 | | | |
| Oct 9-13 – No classes (Fall Reading Week) | | | |
| | Oct 16 | | Midterm I |
| | Oct 18 | 9 | Island Biogeography Theory |
| Oct 18-19 – Lab 4: Plant Communities I: Species-Area Curve | | | |
| | Oct 23 | 10* | Colonisation: space and dispersal – connectivity and corridors (EEB Oct. 12, 2011) |
| Section III: Community Properties | Oct 25 | 11 | Gradients and boundaries: distance decay models |
| Oct 25-26 – Lab 5: Plant Communities II - Ecotones | | | |
| | Oct 30 | 12* | Metacommunities (EEB Jun. 15, 2011) |
| | Nov 1 | 13 | Succession: communities over time |
| Nov 1-2 – Lab 6: Plant Communities III – Data Analysis Computer lab: Wednesday PM in HSB 16, Wednesday AM in SSC 1000, Wednesday PM in SSC 1032 | | | |
| | Nov 6 | 14* | Interactions and Stability (EEB Oct 17, 2010) |
| | Nov 8 | 15 | Food webs |
| Nov 8-9 – Lab 7: Coarse Woody Debris I – Sampling | | | |
| | Nov 13 | | Midterm II |
| | Nov 15 | 16 | Top-down & Bottom-up: trophic cascades and indirect effects |
| Nov 15-16 – Lab 8: Coarse Woody Debris II – Data Exploration *Location to be announced* | | | |
| Note: there is nothing to hand in from this lab, but it is an opportunity to discuss ideas with your TA | | | |
| Section IV: Community disassembly | Nov 20 | 17 | Disassembly: the process of extinction |
| | Nov 22 | 18* | Disturbance: IDH (EEB May 28, 2009) |
| Nov 22-23 – Lab 9: Coarse Woody Debris III – Data Analysis Computer lab: Wednesday PM in HSB 16, Wednesday AM in SSC 1000, Wednesday PM in SSC 1032 Note: there is nothing to hand in from this lab, but it is an opportunity to get help with your data analysis from your TA | | | |
| | Nov 27 | 19 | Stressors: climate change, habitat loss, SLOSS |
| Section V: Consequences of Biodiversity Loss | Nov 29 | 20* | Biodiversity-Ecosystem Function relationships (EEB May 17, 2017) |

| Nov 29-30 – No labs | | | |
|---------------------|-------|-----|--|
| | Dec 4 | 21 | Trait-based approaches and functional diversity |
| | Dec 6 | 22* | Ecosystem services and planetary boundaries (EEB Apr 22, 2016) |

Lab schedule

| Date | Location | Lab # | Description |
|-------------|--|--------------|---|
| Sept 13-14 | - | No labs | |
| Sept 20-21 | BGS 2077 | 1 | Stream Invertebrates I - Sampling |
| Sept 27-28 | BGS 2077 | 2 | Stream Invertebrates II – Identification |
| Oct 4-5 | Computer lab (see below) | 3 | Stream Invertebrates III – Data Analysis |
| Oct 11-12 | | No labs | Reading week |
| Oct 18-19 | BGS 2077 | 4 | Plant Communities I – Species-Area Curves |
| Oct 25-26 | BGS 2077 | 5 | Plant Communities II - Ecotones |
| Nov 1-2 | Computer lab (see below) | 6 | Plant Communities III – Data Analysis |
| Nov 8-9 | BGS 2077 | 7 | Coarse Woody Debris I - Sampling |
| Nov 15-16 | Location to be announced (tentatively BGS 2077) | 8 | Coarse Woody Debris II – Data Exploration |
| Nov 22-23 | Computer labs (see below) | 9 | Coarse Woody Debris III – Data Analysis |
| Nov 29-30 | | No labs | Work on lab report independently |

Computer labs

Your location depends on your lab section. Note that the lab section number does not correspond with the order that each section has their lab, so double-check and make sure that you are going to the right location.

Section 002: Thursday 2:30-5:30pm (SSC 1032)
 Section 003: Wednesday 2:30-5:30pm (HSB 16)
 Section 004: Thursday 9:30am-12:30pm (SSC 1000)

Accommodation for Medical Illness

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean’s office of your Faculty as soon as possible, and notify the instructor immediately. It is the student’s responsibility to make alternative arrangements with the instructor once the accommodation has been approved and the instructor has been informed.

As part of university policy, students that have been granted permission by the Dean’s Office to write the make-up examination will write the exam at a time scheduled by the instructor. There will be one written make-up examination given within two weeks of the originally scheduled exam. The format of the make-up exam is at the discretion of the instructor. Arrangements will be made for students that have valid reasons for missing this make-up.

Students who miss an exam and do **not** receive appropriate accommodation from their Dean's Office will be awarded a '0' for the missed examination. There are no exceptions to this policy. Exams and/or assignments will **not** be re-weighted to accommodate poor performance on any assessment in this course, or for unapproved absence during the mid-term or final exam. Additional assignments will not be accepted in lieu of a missed exam, lab, or to account for poor performance on any course component.

Please refer to the University's Policy on Accommodation for Medical Illness and Student Medical Certificate at: <https://studentservices.uwo.ca/secure/index.cfm>

In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from your Dean's Office immediately. For further information, please see: <http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Academic Accommodations for Religious Holidays

Effective September 1, 1997, the Faculty of Science strictly adheres to the University policy on accommodation for students based upon conflicts with religious holidays (see the appropriate section in the current Western Academic Calendar). Accommodation will only be granted for the specified date of the religious holiday. Only holidays appearing on the University-approved list of dates will be accommodated. See the Office of the Dean for the list of approved dates. Students requesting accommodation must do so, in writing, to the Office of the Dean at least a month before the scheduled exams.

Accessibility

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x82147 for any specific question regarding an accommodation.