

**Dr. Tom Langen:** tlangen@clarkson.edu, phone 268-7933

**PROFESSOR OFFICE HOURS:** Mon & Wed 10:00-12:00, in SC 163 (office) or 170G (lab)

**TEXT:** Tom Wessels' *Reading the Forested Landscape* (Countryman Press). A useful optional resource is JA Pechnik (1997) *A Short Guide to Writing About Biology*, 3<sup>rd</sup> Edition or Knisely (2002) *A Student Handbook for Writing in Biology*, available at the bookstore.

**MEETINGS:** MON @ 8:00 AM (section 10), FRI @ 8:00 AM (section 20), in Science Center 134 or Soccer Field

**COURSE NEWS & INFORMATION:** This will be posted on the BY224 Blackboard Site.

DATE	TOPIC	EXERCISE	DUE DATE	CHAPTER
Aug 25/29	Intro to Field Ecology	Walk & Discussion – field		Intro, 1
Sep 1/5	Soils & Soil Formation	Soil Sampling – field		2
Sep 8/12	Biotic & Abiotic Edge Effects	Microclimate & Nest Transects - field		
Sep 15/19	Biotic & Abiotic Edge Effects	Microclimate & Invasive Plants– field	<b>Sep 26</b>	
Sep 22/26	<i>no formal meeting</i>	Independent Project Time		
Sep 29/ Oct 3	<i>no formal meeting</i>	Independent Project Time	<b>Project Proposal Oct 31</b>	
Oct 6/10	Estimating Species Richness	Leaf Litter Faunal Diversity – field		3
Oct 13/17	Quantifying Species Diversity	Leaf Litter Faunal Diversity - lab	<b>Oct 31</b>	4
Oct 20/24	Mark & Recapture Estimates	Isopod Mark-Recapture – field		5
Oct 27/31	Mark & Recapture Estimates	Isopod Mark-Recapture – field & lab	<b>Nov 7</b>	6
Nov 3/7	Measuring Density & Dispersion	Maple Dispersion – field		7
Nov 10/14	Mapping	Maple Dispersion - lab	<b>Nov 21</b>	8
Nov 17/21	<i>no formal meeting</i>	Independent Project Time		
Nov 24/28	<i>no formal meeting</i>	Independent Project Time	<b>Dec 12</b>	
Dec 1/5	Wrap-up Meeting	Lab		

*Note: On field days, wear appropriate clothing for working in the outdoors. It is often colder than you think! Bring water & snacks if you need them. Always bring your field notebook to every class meeting, and any other trip into the field.*

**COURSE OBJECTIVES:** Ecologists must develop a large kit-bag of skills to ask questions about Nature, including techniques and methodologies, and an ability to carefully observe and learn about the natural history of organisms. Nature is messy - experimental control is difficult, and most ecologists must fret about many subtle forms of sampling bias that can creep into a study. Therefore, successful ecologists learn how to think critically and how to design methods to answer the questions they wish to ask. Furthermore, they learn how to report their results so that others can evaluate the study and ultimately replicate or improve them. The most important skill that an ecologist must acquire, however, is the ability to spot interesting natural phenomena that are amenable to ecological research.

I have five objectives for this lab course: You will (1) Learn some of the fundamentals about the ecology of the Adirondack/ St Lawrence Valley, and how to carefully observe organisms to learn more about it. (2) Learn some of the simple, straightforward techniques by which ecologists ask fundamental questions about Nature. (3) Learn to think clearly and critically about the design and interpretation of field experiments. (4) Polish your skills at accurately reporting the results of your research. (5) Learn how to conduct a simple independent research project that answers an interesting ecological question.

**COURSE OUTCOMES:** By the end of the course, you should be able to (1) understand some of the natural history of Clarkson Woods, (2) design and conduct a simple field ecology experiment, (3) know how to do simple quantitative analysis of data and report it so readers can interpret what you did, and (4) write a clear and accurate research report in the form of a scientific paper.

**CLARKSON COMMON EXPERIENCE:** This course counts as a C1 (one communication point) toward the Clarkson Common Experience Requirements.

**COURSE ACTIVITIES:** This course meets only once a week, and usually cannot be made up. **THEREFORE YOU CANNOT MISS A MEETING!** If you do miss a meeting, your grade will be reduced by a fraction proportional to the amount of work missed (see below). You are expected to be on time to class too – if you are late, you may find that we have already left for the field without you!

*There are four components of the course:*

**Text Readings:** The chapter readings from *Reading the Forested Landscape* are integral to the course. We will see many of the phenomena described in this book, and it will provide a good source for your independent projects. After the first week, I expect you to have read the chapter before the lab meeting. **In your field notebook, you must write an entry based on each chapter, noting at least three interesting phenomena described in the chapter to look for while hiking in the forest.**

**Walk & Discussion:** Each *Walk & Discussion* will cover a theme. We will look at aspects of the ecology of the forest, and try different ecological sampling techniques. **You must be an active participant – I will ask you questions and make you think!** Make sure that you get enough sleep the night before.

You will take notes in your notebook. The notebook is meant to be a resource useful to you for review and thinking about interesting ecological projects. Every notebook will be different; it is kind of a diary where you record information, data, and also place reflections. Keeping a field notebook is an important habit to start.

Although the notebook is meant as a personal aid, there are some guidelines to keeping a field notebook. A template is attached. These guidelines are designed to make sure that you can extract information later that may not seem useful now, but may prove to be important in the future. Also, your notebook may be useful to other researchers, who may extract data from it long after you are dead. For example, important information about environmental change (e.g. changes in species composition breeding dates) has been acquired by inspecting field notebooks of naturalists written a century ago.

I will collect your notebook 2-3 times during the semester. It will be graded on the following rubric: 0 = not turned in, 1 = poor (no useful information, unreadable), 2 = fair (some useful information but incomplete, hard to read), 3 = good (generally informative and readable), 4 = outstanding (provides notes and observations useful to others, interesting to read).

**Field Exercises:** There are five field projects in this course. Four projects are designed and led by myself. Each of these will require two lab periods to complete. The fifth is an independent project that you will design (see below).

Except for the independent research project, you will work in small groups to conduct each project. However, each person, INDIVIDUALLY, will write a short scientific report (5-10 pages, double-spaced) on her/his project. I will provide a model for this paper, which will be similar to those written in freshman bio. I will also provide a detailed grading rubric that you can use as a guide for your reports. You should have a skilled colleague read over a draft of your report so that you can make corrections before turning it in to me. I encourage you to discuss your paper with group members (after all, it is a group project) but there must be no plagiarism. I will dock points for reports (or portions of reports) that are the result of joint writing (e.g. two identical reports each receive ½ the points the report would have received if single-authored). 10% of the total score will be docked for papers that are more than one week late.

For the four group-project write-ups, within two weeks of receiving your write-up, I will edit the paper, provide a grade, and return it to you. You are then expected to turn in a revised version for an improved grade. This revised report must be submitted, along with the original, no more than two weeks after the original is returned to you. Your score will be the average of the original and revised versions.

**Independent Project:** The independent project will be designed and conducted by you alone. You can, however, consult with myself, or other resource people on ideas and design questions. The project must be conducted on the grounds of Clarkson University. Good projects will contribute information that can be used to develop and manage the campus in a wise and sustainable fashion. The project must include at least four hours of field or laboratory work. The project can be a manipulative experiment, a quantitative comparison of the ecological features of two (or) more locations, or a biotic or mapping survey of one of the Clarkson Campus natural areas. I will help you select a project, based on your interests and abilities. You must have my approval before starting a project. For approval, you will need to submit a short (1-3 paragraph) proposal, which includes the hypothesis to be tested, the methodology, materials needed, and timeline. This will be due October 31 (although earlier is better)

The project can be conducted at anytime - you don't need to wait until the last two weeks of class. In fact, for many kinds of studies you will need to start before it gets too cold. You will be evaluated on the soundness of the study design for answering the question you pose, and the ecological importance of the study, as well as the standard criteria stated in the my grading sheets. The write-up is due **Friday of finals week (Dec 12)**. If you provide me with a draft on or before **Wed Dec 3**, I can provide comments & feedback for revision. Your grade will only be based on the final (revised) draft, not the earlier draft.

**GRADING:** Your grade will be based on the following: 15% Notebook & Participation, 15% per group exercise, 25% for the independent project. Each category percentage is based on the total points possible for that category. Course grades will be based on a percentage of the total points: 90% or greater = A, 87-89% = B+, 80-86% = B, 77-79%=C+, 70%-76% = C, 67-69% = D+, 60-66% = D, 59% or less = F. However, I reserve the right to curve down (lower the grade cutoffs) if I judge it warranted.

**FINAL POINT:** The schedule (and some of the exercises) may be modified during the semester. In particular, the weather and the availability of some course equipment may affect the timing of projects.