

BIOLOGY 350.3 - HONOURS FIELD COURSE

- 1 **Dates:** Monday, August 22 - Friday, Sept 2,, 2010 inclusive.
Meet in Room 221 of the Biology Building at 9:00 a.m. on August 22. Baggage can be taken to the loading dock at the rear of the building to be put on the van. (see map and directions to the Emma Lake area in the Odum attachment) .
 2. **Instructors:** Dr. Dennis Lehmkuhl and Scott Halpin
 3. **Reading material:** (by attachment and at dennislehmkuhl.com- **teaching materials**) -
Odum, Eugene P. 1962. Relationships between structure and function in the ecosystem. Japanese Journal of Ecology 12(3): 108-118.
-Smith and Smith, Freshwater Lakes and Streams, Food Chains
 4. **Cost:** Accommodation fee is \$500.00. This helps to pay for your accommodation, meals, boat certification and is in addition to the normal course registration fee. If you already have a license to operate a boat, bring your license to Joan or Deidre for copying (B151/148) and the cost will be \$485.00. Please pay by cash, money order or certified cheque (made payable to the Department of Biology) prior to your departure to Emma Lake. The **money order, certified cheque or cash (NO personal cheques)** should be given or sent to Ms. Kendra Panko, Room 164, Biology Department prior to leaving.
- NOTE 1:** The cost of accommodations provided is \$27 per night based on shared student rate accommodations. If you need separate accommodations or wish to share a cabin with one other person only, then the cost per night goes to \$80 and \$40, respectively. Students will be expected to bear the additional costs if you choose these options.
- NOTE 2:** If you plan to take your own vehicle, please let us know (Scott Halpin (966-4493, Joan, 966-4400). Also, please let us know if you have any specific needs or requirements that need to be arranged before the course. Note that due to limited parking we suggest that you avoid bringing a personal vehicle if at all possible.
- NOTE 3:** Several PC's will be available at the campus for communal use, but it will be convenient if you bring your own laptop, - useful in the lab and for report writing. Finicky and slow wireless internet can be accessed from the dining hall.

5. Course Equipment

- (a) **Essential:** Field notebook - obtain at least one hardcover notebook from University Center Shop, e.g., Wade field book, Cat. #515/8671100; other suitable books are Pico or Write-in-the-Rain)
 - Dissecting kit
 - Paper and writing materials - note: write field notes in pencil
 - Field bag or small knapsack
 - Field clothing - including light jacket & warm coat
 - Rain gear including waterproof pants
 - Boots - these may get very wet
 - Personal toilet articles
 - Calculator
 - A flash drive (memory stick) or a floppy disk

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| (b) <u>Desirable:</u> Hat | Gloves |
| Bathing suit | Compass/GPS |
| Mosquito net or repellent | Clipboard |
| Binoculars | |

Other course equipment will be provided including plant presses and insect collecting and mounting supplies for anyone wishing to make personal collections, and for group or individual projects.

- 6 Accommodation and meals:** Kenderdine Campus is attractively located at the shore of Emma Lake (see map in Odum attachment). Cabins typically house 2-5 people and there is a separate building for showers and washrooms. This building also has washing machines, so you may wish to bring some laundry soap. There is a central dining facility on the lake shore. The food is excellent and there is sufficient choice if one is a vegetarian. Again, if you need separate accommodations or wish to share a cabin with one other person only, see note 1 on page 1 of this outline.

***you MUST bring a sleeping bag, pillowcase, towels and snacks for your stay. This is so that we can obtain a reduced rate for accommodation.**

- 7 Nature of the Course and class evaluation** (see course description below) The course will consist of group projects on the structure of forest, lake, and river systems, especially from the point of view of the references attached or available at dennislehmkuhl.com (Course Material, Emma Lake Odum and Smith and Smith) This will require about 2/3 of the course time. The course will also include an individual project (may be done in pairs or small groups) requiring 3-4 days, finishing with an oral report on your project and a 1-3 page handout to the rest of the class, giving information of your choice. Time will also be spent looking at other aquatic and forest ecosystems to acquaint you with the general ecology and natural history of the Emma Lake area. This will occupy the remainder of the time.

Class Evaluation:

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| (a) <u>Field notebook:</u> | 15 % You will be given instructions about how to make field notes at the beginning of the course |
| (b) <u>Project Proposal:</u> | - 10%, due Saturday August 27 |
| (c) <u>Individual project:</u> | - 25% oral presentation and executive summary |
| (d) <u>participation/initiative</u> | - 5% |
| (e) <u>Reports:</u> | - 45%, due Friday, August 27, or within 1 week, (Sept. 3) |
| (i) | A key to the vegetative characteristics of 25 plant species (15%) |
| (ii) | Summary and abstract, what you learned about lakes, rivers, and the forest, compare and contrast community structure, energy flow, and food chains, using the attached material (Odum and Smith) as a guide. Eight to 10 pages is suggested, to be turned in on the last day of the course or within 1 week (30%) (see reports above). |

Late assignments are penalized by -10% per day including weekends.

BIOLOGY 350.3 HONORS FIELD COURSE

COURSE DESCRIPTION

Students will be challenged to apply the scientific method working in the field with natural environments, species, communities, and ecosystems as found in nature. Emma Lake provides a variety of habitats and systems, including lakes, rivers and forests. Informal lectures and discussion will provide a framework for fieldwork and projects. Emphasis will be placed on gaining an understanding of the challenges of field work, including identification of organisms, the problem of quantitative sampling vs. collecting, the search for patterns and processes in natural systems, and working with data and drawing conclusions. Conclusions will be presented and discussed in written and oral reports.

The actual field work will involve:

1. The identification of local flora and fauna and some knowledge of their evolutionary adaptations. Students are assigned to develop a field key based on vegetative characteristics for 25 species of woody plants.
2. Study of several local systems, including a lake, a stream or river, and the forest. Trophic relationships (source of energy and energy pathways), biodiversity, and the biotic and non-biotic aspects of the systems will be emphasized. Specific areas of study will include general description of physical and community structure and identification of community members in several habitats. There will be quantitative sampling and methods compared. There will be benthos sampling in the littoral and open water areas of a lake, plankton sampling, river sampling, and forest sampling.

Written Report

3. A final report written by each student will be a comparison of the forest, lake, and flowing water ecosystems, especially regarding biodiversity, trophic structure and the biotic and abiotic features of the systems. Use Odum and Smith for concepts to be considered.

Individual Project

4. Students will plan and conduct an individual or two-person project which allows you to study areas of special interest. The projects should take approximately 3-4 days to complete and an oral and written report will be handed in and made available to other class members.

Notes on Individual Projects- (see also 7. above) Notice in the schedule below that you will be introduced to plants, the forest, the lake, and flowing water within the first 4 days. This is so you will be better able to identify your area of greatest interest and for you to become aware of some of the problems and methods associated with studying that part of the ecosystem. For a project, you should aim to become an expert on some topic, and you might decide to focus at the level of biodiversity and species richness, and do an annotated collection, for example of insects, plankton organisms, non-flowering plants, soil organisms, or any other group. Or you might decide to go deeper into structure and function of the ecosystem, and identify and quantify trophic levels, food chains, species diversity, landscape ecology, species rank abundance, or any of a number of other aspects of ecosystems. This will require more thought and planning, and if you have any special interests, you may wish to start planning now. Or you might decide to focus on a single species- observing behaviour, activity, food habits, distribution, etc, for example for some bird, fish, insect, or plant. It will be a challenge to design, propose and complete a good project, but that is part of our goal in this course.

Tentative Weekly Schedule Monday, August 22- Friday, Sept 2

August 22,

Monday- **Depart Saskatoon**, Local Emma Lake Plants and Vegetation, Collection and Plant Key

Tuesday- **Forest Sampling**

Wednesday- **Lake Sampling**, shore and open water, Emma Lake

Thursday- **River Sampling**, Cecil Ferry

Friday- Lake and River **Sample Analysis**, community structure, species richness, food chains

Saturday- Unscheduled except to **prepare proposals for individual projects**

Sunday-Finish Lake and River analysis, **plan your assigned written report**, individual projects

Monday- Wednesday, **individual projects**, assigned reports

Thursday- **Oral reports and discussions**

Friday, Sept 2, hand in completed assignments, **depart 10:30 AM**, lunch in Prince Albert