

## EEB 319 – Population Ecology

### Time and Place:

Lectures: Mondays and Wednesdays, 1-2 PM, RW110

Labs: Thursdays 9-12 AM or 1-4 PM

RW203/205 (lab rooms) or CQUEST rooms (computer rooms) - see Lab schedule

### Contacts:

#### Instructor

Prof. Martin Krkosek, martin.krkosek@utoronto.ca, 416-978-3839, RW402

Office hours: Contact me by e-mail to schedule a time.

*\*\*\* For all e-mail communication, make sure you put EEB319 in the title of your message or it might be deleted with the dozens of junk messages I get every day. If you do not get an answer within 24 hours (excluding week-ends), try again; your message might have gotten lost... I do not accept any electronic submission of lab reports.*

#### Teachings assistants:

Thurs **AM** Jordan Pleet, [jordan.pleet@utoronto.ca](mailto:jordan.pleet@utoronto.ca)  
office hour: by appointment

Thurs **AM** Karl Lamothe, [karl.lamothe@mail.utoronto.ca](mailto:karl.lamothe@mail.utoronto.ca)  
office hour: by appointment

Thurs **PM** Paul Simpson, [paul.simpson@mail.utoronto.ca](mailto:paul.simpson@mail.utoronto.ca)  
office hour: by appointment

### Marking Scheme:

Seed beetle lab	10	
Population growth lab	5	
Competition lab (5 marks for oral presentations)	20	
Simutext Questions	5	40
Midterm	30	
Final	30	60
Total		100

**NOTE:** Please hand in everything on time!! There will be a penalty of -5% per day (including week-ends) for all late lab reports. We do **NOT** accept electronic submissions of course work. Failure to submit your data to class data sets by the due date will result in a -10% penalty on your lab report.

## Course Web page (on Blackboard):

All course information will be stored on Blackboard (<http://portal.utoronto.ca/>). You will have access to the Syllabus, Lecture Schedule & Recommended Readings for each lecture, Lab Schedule, Lab Instructions, Lecture slides (pdf files) and Lab Data sheets. If you have any problem accessing the material, let me know right away so I can fix the problem (e-mail is best).

For several labs, you will need to share your data with the rest of your group or with the whole class. We will ask you to enter your data in Google Document – you TA will give you instructions on how to do this. ***Data files are due at the latest the day after the lab.*** Failure to submit your data to class data sets by the due date affects the whole class and will result in a -10% penalty on your lab report.

## Recommended textbooks:

### Recommended Textbooks:

*Different authors take different approaches to the material. Take the time to read different textbooks and to find out which one best suits your learning style.*

### Introductory:

Begon M., C.R. Townsend and J.L. Harper. 2006. *Ecology: from individuals to ecosystems*. 4<sup>th</sup> ed. Blackwell Publishing, Malden, MA, USA. QH541.B43 2006  
Krebs, C.J. 2009. *Ecology: the experimental analysis of distribution and abundance*. 6<sup>th</sup> ed. Benjamin Cummings, San Francisco. QH541.28 K74 2001  
Ricklefs, R.E. and G.L. Miller. 2000. *Ecology*. 4th ed. New York: W.H. Freeman & Co. QH541.R53 2000X.

### Advanced:

Vandermeer, J.H. and Goldberg, D.E. *Population Ecology*. Princeton University Press., Princeton, NJ, USA. QH352 .V36 2003X

## Labs and lab reports:

The main goals are to:

- 1) integrate and apply concepts and theoretical models learnt in class,
- 2) learn how to collect data with real organisms (technical skills),
- 3) learn how to use basic statistics to analyze and interpret data,
- 4) realize that data do not always fit theoretical models, but that it is important to collect and interpret data with a larger theoretical framework in mind,
- 5) learn how to work in group.

To enhance your learning experience and take full advantage of your time in the lab, I suggest you read carefully through the lab material before the lab. Also, please arrive on time. There will be important information given at the beginning of each lab.

Detailed instructions on what we expect in each lab reports are provided in the lab manual. Follow these instructions carefully and do not hesitate to ask your TA questions if something is not clear. You will be graded on how well the material is presented and on how clearly you describe the data and explain your conclusions. Helpful suggestions on how to write lab reports are available on the UofT Writing Centre website.

How to write a good formal lab report:

- Always use a clear structure when you are writing. Organize the information into paragraphs. Use headings and subheading.
- Use simple, clear language.
- Use formal language.
- Support all opinions with evidence and logical arguments. Only include comments that are relevant to your arguments.
- Graphs should be clear, concise and un-cluttered. Always label the axes (with units). Use appropriate axis scales to maximize the use of space. Include a clear legend. Remove background fills and lines (it makes the graph easier to read and it saves ink).
- Each graph and table should have a clear legend. The legend should include a brief sentence explaining what the graph or table is about (i.e. provide a title). It should also explain what different symbols, lines or shadings mean. The reader should be able to read a graph or table without having to refer to the text.
- Do not exceed length guidelines for lab reports. Use 12-point font, double spaced.
- Print lab reports on both sides of the page.

The due dates for each lab report are listed on the lab schedule. Hand in a hard copy of your lab reports at the beginning of the lab.

## Computer labs:

We will use the RW CQUEST computer room for two of our labs (RW107/RW109/UC261). To use the CQUEST workstations, you will need to create a login account BEFORE THE FIRST LAB (at least 24h before the lab) by signing up at: <http://www.cquest.utoronto.ca/>

Saving data: The CQUEST computers have a LINUX operating system that emulates Windows 2000. This means that nothing is saved between sessions, unless you save it on a disk or USB key, or in your own account on the CQUEST server. To access your CQUEST storage location, double-click on “disk.srv” under “Save”. You will then be asked for your user name and password.

Printing: All CQUEST facilities have printers. To pay for your printouts, you will need tokens, which can be purchased with townies in the Sid Smith CQUEST lab. For more information on printing, see:

<http://www.cquest.utoronto.ca/infodocs/faq/printquotas/coinbox.html>

Access after scheduled lab: Should you wish to work on those labs at other times, you can use any of the CQUEST workstations (RW107/109, UC261, SS2105, ES1046) when there are no class scheduled.

## Improving your Writing skills:

Effective communication is crucial in science. The University of Toronto provides services to help you improve your writing (see specific section on lab reports), from general advices on effective writing to writing centers and writing courses. See <http://www.writing.utoronto.ca/>. The Faculty of Arts & Science also offers an English Language Learning (ELL) program, which provides free individualized instruction in English skills. Take advantage of these!

## Academic Integrity:

You should be aware of the University of Toronto *Code of Behaviour on Academic Matters*. Also see <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize> on *How Not to Plagiarize*. Note that it is NOT appropriate to use large sections from internet sources, and inserting a few words here and there does not make it an original piece of writing. Be careful in using internet sources – there is no review of most online material and there are MANY errors out there. Use only academic or government internet sources when absolutely necessary. Make sure you read material from many sources (published, peer-reviewed, trusted internet sources) and that you write an original text using this information. Always cite your sources. In case of doubt about plagiarism, talk to your instructor.

## Lecture Schedule

Week	Date	Day	Activity	Topic
1	08-Sep	Mon	Lecture 1	Introduction, organization, definitions
		Wed	Lecture 2	Abundance, distribution, niche
2	15-Sep	Mon	Lecture 3	Intraspecific competition, logistic growth
		Wed	Lecture 4	Allee effects, alternate stable states
3	22-Sep	Mon	Lecture 5	Stochasticity
		Wed	Lecture 6	Nonlinear population dynamics
4	29-Sep	Mon	Lecture 7	Life-history analysis
		Wed	Lecture 8	Life-tables, structured populations
5	06-Oct	Mon	Lecture 9	Meta-population dynamics
		Wed	Lecture 10	Spatially-structured populations
6	13-Oct	Mon	Thanksgiving - No Class	
		Wed	Lecture 11	Midterm Review
7	20-Oct	Mon	Lecture 12	Interspecific competition
		Wed	Lecture 13	Plant competition, coexistence
8	27-Oct	Mon	Lecture 14	Plant-herbivore interactions
		Wed	Lecture 15	Predator-prey dynamics
9	03-Nov	Mon	Lecture 16	Parasitism
		Wed	Lecture 17	Parasitoids
10	10-Nov	Mon	Lecture 18	Epidemiology
		Wed	Lecture 19	Immunology
11	17-Nov	Mon	Fall Break - No Class	
		Wed	Lecture 20	Mutualism
12	24-Nov	Mon	Lecture 21	Intraspecific variation, portfolio effects
		Wed	Lecture 22	Harvesting
13	01-Dec	Mon	Lecture 23	Conservation biology
		Wed	Lecture 24	Final Review

## Lab Schedule and Due Dates

Week	Date	Activity	Topic	Due
1	11-Sep	Lab 1	Design seed beetle experiment	
2	18-Sep	Lab 2	Set up seed beetle experiment	
3	25-Sep	Lab 3	End seed beetle experiment	
4	02-Oct	Lab 4	Theoretical population growth	Beetle Lab (10%)
5	09-Oct	No lab	No lab	Simutext Q's I (2.5%)
6	16-Oct	Exam	Mid-term exam	Mid-term exam (30%)
7	23-Oct	Lab 5	Competition experiment - intro	Pop'n growth lab (5%)
8	30-Oct	Lab 6	Competition experiment - set up	Simutext Q's II (2.5%)
9	06-Nov	Lab 7	Competition experiment - cont'd	
10	13-Nov	Lab 8	Competition experiment - cont'd	
11	20-Nov	No Lab	No Lab	
12	27-Nov	Lab 9	Oral Presentations	Competition lab (20%)