EEB 319 – Population Ecology

Time and Place:

Lectures: Mondays and Wednesdays, 1-2 PM (Zoom)
Labs: Thursdays 9-12 AM or 1-4 PM, Rooms: TBA

Contacts:

Instructor:

Prof. Martin Krkosek, martin.krkosek@utoronto.ca
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. If you do not get an answer within 24 hours (excluding week-ends), try again; your message might have gotten lost.*

Teachings assistants:

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Assessment Schedule

Assessment	Due Date	Marks
Mark-recapture proposal	21-Sep	5
Grizzly lab	28-Sep	5
Harvesting lab	12-Oct	5
Mark-recapture report	19-Oct	5
Chaos lab	02-Nov	5
Structured population lab	16-Nov	5
Stability and resilience lab	23-Nov	5
Disease modeling lab	30-Nov	5
Midterm	Oct. 23	30
Final Exam	TBD	30

***NOTE**: Please hand in everything on time!! There will be a penalty of -5% per day (including week-ends) for all late lab reports.*

Course Web page (on Quercus):

All course information will be stored on Quercus. You will have access to the syllabus, course schedule, lab assignments, readings, and lecture slides (when available – many lectures will be on a chalk board). Chalkboard notes we develop in a lecture will be posted as a PDF after the lecture. If you have any problem accessing the material, let Prof Krkosek know right away so he can fix the problem.

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*. 4th ed. Blackwell Publishing, Malden, MA, USA. QH541.B43 2006

Krebs, C.J. 2009. *Ecology: the experimental analysis of distribution and abundanc*e. 6th 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:

Most of the labs will require computer work in Excel to either analyze data or work with a model. Please contact Prof Krkosek if you do not have access to Excel.

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 descriptions that will be uploaded to Quercus. 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 results 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 subheadings.
- Use formal, simple, and clear 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.
- 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.

The due dates for each lab report are listed on the lab schedule, and are typically due before the start of following week's lab. All lab reports will be submitted electronically to your TA. Your TA will explain to you how to electronically submit.

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 and Lab Schedule

Wk	Date	Day	Activity	Topic
1	11-Sep	Mon	Lecture 1	Introduction, organization, overview
		Wed	Lecture 2	Abundance and distribution
		Thurs	Lab 1	Mark-recapture lab 1
2	18-Sep	Mon	Lecture 3	Population growth and the Niche
		Wed	Lecture 4	Limitation and regulation of populations
		Thurs	Lab 2	Conservation of grizzly bears
3	25-Sep	Mon	Lecture 5	Logistic growth
		Wed	Lecture 6	Allee effects
		Thurs	Lab 3	Mark-recapture lab 2
4	02-Oct	Mon	Lecture 7	Functional responses and predation
		Wed	Lecture 8	Alternative stable states and resilience
		Thurs	Lab 4	Harvesting and stability lab
5	09-Oct	Mon	Thanksgiving - No Class	
		Wed	Lecture 9	Environmental and demographic stochasticity
		Thurs	Lab 5	Mark-recapture lab 3
6	16-Oct	Mon	Lecture 10	Chaotic population dynamics
		Wed	Lecture 11	Midterm review
		Thurs	Lab 6	no lab - study instead!
7	23-Oct	Mon	Lecture 12	Midterm exam
		Wed	Lecture 13	Chaos - tribolium example, time series evidence
		Thurs	Lab 7 - part 1	Nonlinear dynamics and chaos lab
8	30-Oct	Mon	Lecture 14	Structured populations
		Wed	Lecture 15	Matrix models and application to conservation
		Thurs	Lab 8	Structured population growth lab
9	06-Nov	Mon	Fall Break - No Class	
		Wed	Fall Break - No Class	
		Thurs	Fall Break - No Lab	
10	13-Nov	Mon	Lecture 16	Metapopulation dynamics and extinction debt
		Wed	Lecture 17	Source sink dynamics, synchrony, portfolio effects
		Thurs	Lab 9	Stability and resilience lab
11	20-Nov	Mon	Lecture 18	Spread of infectious disease
		Wed	Lecture 19	Competition (coexistence)
		Thurs	Lab 10	Disease modeling lab
12	27-Nov	Mon	Lecture 20	Competition (other scenarios)
		Wed	Lecture 21	Predator-prey dynamics
		Thurs	Lab 11	no lab - study instead!
13	04-Dec	Mon	Lecture 22	Host-parasite dynamics
		Wed	Lecture 23	Final Review