Bio 3SS Introductory material

1 Course structure

Course overview

- Lecture notes for each section will be available on AtL the afternoon before you need them
  - Check AtL frequently for announcements and new information
- The professor is Jonathan Dushoff
  - Office hours Tue 9:30-10:20 AM, Wed 2:30-3:20 PM, or *by appointment,* LSB 332
  - `dushoff@mcmaster.ca`
- The lecture TA is Caroline Cauret
  - Contact through the Facebook group, or AtL

Expectations of professor

- Start and end on time
- Focus on conceptual understanding
- Make clear what terminology and facts must be learned
- Open to questions – both in class (within reason) and at office hours
- Responsive to questions on class forums (Facebook and AtL)

Expectations of students

- Don't talk while other students are talking, or while I am responding to student questions
- If you must talk at other times, be unobtrusive
- Don't use the internet for non-class activities
- Give the professor his 50 min

- Lectures are required
- Tutorials are required, unless otherwise specified
  - If you don't go to tutorials, don't bother us about anything covered in tutorials

Texts

- The primary text for this course is the lecture notes
- You will be given readings, which will be posted to AtL
- You are required to have an Ecology textbook
  - Molles and Cahill, Second Canadian edition is recommended
  - If you would like to use a different textbook, let your TA know, so we can attempt to provide readings.

Structure of presentation

- Required material will be clearly outlined in the notes
  -
- Required terminology will be presented in **bold**
- General ideas and approaches presented in class may also be required; you should take notes on these in your own words

Polling

- You can obtain extra credit by responding to in-class polls
  - Text from your cell phone, or answer on the web
- Why are you taking this class?

2 People

TAs

- Awesome

Dushoff

- Loves math
- Lived in four countries
- Studies evolution and spread of infectious diseases
  - HIV, rabies, ebola, influenza, ...
  - `http://lalashan.mcmaster.ca/theobio/DushoffLab/`
  - `https://twitter.com/jd_mathbio`

Students

- What year are you in?
- What kind of career are you aiming for?

3 Course content

3.1 Learning goals

- Ecology and population ecology
- Quantitative thinking
- Dynamical modeling

- What is ecology?
- My answer
  -
  -

- What is population ecology?
- My answer
  -
  -
  -

Dynamical modeling

- Investigates the links between local, short-term processes, and large-scale, long-term outcomes
- Allows us to explore what assumptions we're making, and how assumptions affect the link

Math

- Population ecology uses math
  - Math is a critical tool for linking processes to outcomes
  - Math will play a central role in the course
- We will keep it *simple*
  - But we understand that simple does not always mean easy
- Review the math supplement

Humans and abstract thought

- People are evolved to be concrete thinkers, not conceptual thinkers
- A goal of this course is to build conceptual thinking skills

3.2 Examples

Malaria

- A nasty, mosquito-borne disease
- In some places (e.g., the southeastern US), it has been eradicated almost by accident
  - Mosquitoes are still present
- In other places it persists at high levels despite concerted efforts at elimination
- *What factors determine when and where malaria spreads?*

Red squirrels

- Red squirrels are rapidly disappearing from England
  - Loss of suitable habitat?
  - Competition from gray squirrels introduced from North America?
  - Diseases carried by gray squirrels?
- `http://en.wikipedia.org/wiki/Eastern_grey_squirrels_in_Europe`

Cod fisheries

- Is the ocean too big for people to affect?
- What happened to the cod?
- `http://en.wikipedia.org/wiki/Collapse_of_the_Atlantic_northwest_cod_fishery`

Populations

- What population of organisms interests you?

Dandelions

- Start with one dandelion; it produces 100 seeds, of which only 4% survive to reproduce the next year.
  - How many dandelions after 3 years?
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