

COMMUNITIES AND ECOSYSTEMS (BIOL 353/4)

Course Outline

SEMESTER	WINTER 2015
DAY / TIME	Wednesday & Friday / 8:45-10:00am
ROOM	LOY – HB 130
INSTRUCTOR	Jean-Philippe (JP) Lessard
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COURSE DESCRIPTION

This course presents an introduction to ecological communities, the processes that maintain them and their emergent properties. Topics include the interactions between abiotic and biotic factors in determining community composition, the concepts of niche and habitat, succession theory, community diversity and stability, energy flow and nutrient cycling. Examples emphasize both aquatic and terrestrial ecosystems, and the major global biomes.

Prerequisite: Biology 225, 226 or permission of the department

REQUIRED TEXT

- Smith TM, Smith RL & Waters I. 2014. *Elements of Ecology* (Canadian Edition). 1st edition. Pearson Canada Inc. 744 pp.

OTHER RELEVANT BOOKS

- Lomolino MV, Riddle BR, Whittaker RJ, Brown JH. 2010. *Biogeography*. 4th edition. Sinauer Associates Inc. 764 pp.
- Chapin FS, Matson PA & Vitousek P. 2012. *Principles of Terrestrial Ecosystem Ecology*. 2nd edition. Springer. 529 pp.

LECTURES

Lectures will cover the material in assigned chapters (or chapter sections) and rely on selected scientific articles to provide concrete examples of relevant scientific research. You should read the assigned chapter before coming to class. I will sometime provide quizzes (i.e. on Moodle) following the lecture to assist you in keeping up and understanding lecture and textbook material. Because my lectures will not always follow the order in which the material is presented in the textbook, I highly recommend that you attend lectures. I encourage students to communicate with each other and work in small groups to review material.

SUPPLEMENATRY READINGS

Scientific articles selected from the primary literature will be assigned to supplement material covered in the textbook when needed. PDF files of these articles can be downloaded from Moodle. These articles will usually be mentioned during the lectures, where important points will be emphasized. You are not expected to know the details of each article, but you should be familiar with the general ideas, and understand the main points.

QUIZZES & EXAMS

There will be no assignment in this course. There will be a mid-term examination and a final examination.

EVALUATION

MID-TERM	40%
FINAL	60%

GRADING SCHEME

A+>90, A=85-89, A-=80-84, B+=77-79, B=73-76, B-=70-72, C+=67-69, C=63-66, C-=60-62, D+=57-59, D=53-56, D-=50-52, F<50

OFFICE HOURS

I do not have fixed office hours. If you need clarifications on the material covered during lectures, I strongly encourage you to come see me immediately after class. You may also schedule an appointment with me via e-mail. If you do so, please suggest a specific day and time (even better if you can suggest a few options).

TENTATIVE SCHEDULE (subject to change during the semester – some topics might not be covered and others might be expanded)

DATE	L#	TOPIC	READING
07-Jan	L1	Introduction & definition	Ch. 1
09-Jan	L2	Quantification of community structure	Ch.16
14-Jan	L3	Community change in space I	Ch. 23
16-Jan	L4	Community change in space II	Ch. 27
21-Jan	L5	Temporal dynamics	Ch. 17
23-Jan	L6	Spatial dynamics	Ch. 12, 18
28-Jan	L7	Coexistence	Ch. 13
30-Jan	L8	Evolutionary Dynamics	Ch. 6, 13
04-Feb	L9	Historical factors	NA
06-Feb	L10	Competitive interactions	Ch. 13
11-Feb	L11	Positive interactions	Ch. 15
13-Feb	L12	Trophic interactions	Ch. 14
18-Feb	L13	Food chains & food webs I	Ch. 16
20-Feb	L14	Food chains & food webs II	Ch. 16
25-Feb		SPRING BREAK	
27-Feb		SPRING BREAK	
04-Mar		MID-TERM	
06-Mar	L15	Productivity and energy flow	Ch. 20
11-Mar	L16	Decomposition and nutrient cycling	Ch. 21
13-Mar	L17	Biogeochemical cycles	Ch. 22
18-Mar	L18	Species diversity and ecosystem stability	Ch. 19
20-Mar	L19	Species diversity and productivity	Ch. 16, 19
25-Mar	L20	Biodiversity hotspots	Ch. 27
27-Mar	L21	Habitat modification	Ch. 27
01-Apr	L22	Introduced species	Ch. 27
03-Apr		EASTER (UNIVERSITY CLOSED)	
08-Apr	L23	Effects of climate change on communities	Ch. 28
10-Apr	L24	Biodiversity, environment, economy and society	Ch. 28