

Concordia University
COMMUNITIES AND ECOSYSTEMS (BIOL 353)
Course Outline

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|----------------------|------------------------------------|
| SEMESTER | WINTER 2022 |
| DAY / TIME | Monday & Wednesday / 13:15-14:30pm |
| LOCATION (in person) | LOY – SP S110 |
| (online) | Zoom link posted on Moodle |
| INSTRUCTOR | Dr. Jean-Philippe Lessard |
| OFFICE | LOY – SP 437.09 |
| EMAIL | jp.lessard@concordia.ca |
| TEACHING ASSISTANT | Dana Martin |
| OFFICE | LOY – SP 301.12 |
| EMAIL | |

COURSE DESCRIPTION

This course presents an introduction to ecological communities and ecosystems, 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.

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(s) and article(s) before attending lectures. Because the content of lectures will not always follow the order in which the material is presented in the textbook, attending lectures, or watching recorded lectures, is essential. Students are encouraged to communicate with each other and work in small groups to review material.

READINGS

Each week, readings in the textbook that complement each lecture are assigned. These should be read ahead of watching the recorded lectures. Scientific articles selected from the primary literature will be assigned to supplement material covered in the textbook. PDF files of these articles can be downloaded from Moodle. These articles will always be discussed during the lectures, where the main points of the

article will be emphasized. Students are not expected to know every details of each article, but they should be familiar with the general ideas, and understand the main points. Students will be quizzed on the scientific articles.

QUIZZES

Throughout the semester, 5 graded quizzes will be given to help students keep track with the course material and understand it. Quiz material will be focused primarily on assigned journal articles but may also include questions concerning other course material presented during lectures. *Material not presented during lectures will not be included in quizzes.* **Each quiz will be worth 4% of the final grade.** Quizzes will be completed through Moodle. **Each quiz will be open for 48 hours.** Students will have 48 hours to complete the quiz from the time is it posted on Moodle.

| QUIZ # | TENTATIVE DATE | OPENING TIME |
|--------|----------------|--------------|
| 1 | 21-Jan | 9:00 AM |
| 2 | 04-Feb | 9:00 AM |
| 3 | 18-Feb | 9:00 AM |
| 4 | 18-Mar | 9:00 AM |
| 5 | 08-Apr | 9:00 AM |

EXAMS

There will be a mid-term examination and a final examination. The mid-term exam will cover all and only the lecture material covered before the mid-term takes place. The final exam will have a strong focus on lecture material presented after the mid-term and until the end of the semester. Material not presented during lectures will not be included in exams.

EVALUATION

| | |
|---------|-----|
| MIDTERM | 40% |
| FINAL | 40% |
| QUIZZES | 20% |

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

Office hours will be announced in the first lecture. In addition, if students are not available during office hours, they can send an email to the professor or teaching assistant to arrange a zoom meeting (we will not answer questions on course material by email). When doing so, please suggest a few day and time options. Please allow at least three

working/business days between the day/time you contact us and the day/time of the proposed meeting. For any issues related to course logistics or grading scheme, please contact your teaching assistant.

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

| DATE | L# | TOPIC | READING |
|--------|-----|---|------------------------|
| 10-Jan | L1 | Introduction | NA |
| 12-Jan | L2 | Quantification of community structure | Ch.16.1 – 16.5 |
| 17-Jan | L3 | Community change in space I | Ch. 23 |
| 19-Jan | L4 | Community change in space II | Ch. 27.1 & 27.2 |
| 24-Jan | L5 | Temporal dynamics | Ch. 17 |
| 26-Jan | L6 | Spatial dynamics | Ch. 12, 18 |
| 31-Jan | L7 | Ecological coexistence | Ch. 13, 16.1 & 16.2 |
| 02-Feb | L8 | Evolutionary coexistence | Ch. 6, 13.11 & 13.12 |
| 07-Feb | L9 | Competitive interactions | Ch. 13 |
| 09-Feb | L10 | Positive interactions | Ch. 15 |
| 14-Feb | L11 | Trophic interactions | Ch. 14 |
| 16-Feb | L12 | Food webs | Ch. 16.6 – 16.8 |
| 21-Feb | L13 | MAKEUP or REVIEW | NA |
| 23-Feb | L14 | MAKEUP or REVIEW | NA |
| 28-Feb | | BREAK | |
| 02-Mar | | BREAK | |
| 07-Mar | | MIDTERM EXAM | |
| 09-Mar | L15 | Ecosystem energetics | Ch. 20 |
| 14-Mar | L16 | Decomposition | Ch. 21 |
| 16-Mar | L17 | Biogeochemical cycles | Ch. 22 |
| 21-Mar | L18 | Species diversity and ecosystem stability | Ch. 19 |
| 23-Mar | L19 | Species diversity and productivity | Ch. 16, 19 |
| 28-Mar | L20 | Biodiversity hotspots | Ch. 27.3 – 27.5 |
| 30-Mar | L21 | Habitat modification | Ch. 27.6, 27.9 & 27.10 |
| 04-Apr | L22 | Introduced species | Ch. 27.7 |
| 06-Apr | L23 | Climate change | Ch. 28 |
| 11-Apr | L24 | MAKEUP or REVIEW | NA |
| 13-Apr | L25 | MAKEUP or REVIEW | NA |