



University Canada West
ECOL 108 – Introduction to Ecology
Course Outline

Course Instructor:

TBA

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1. Course Objective

This course is designed to provide the student with a basic knowledge of the approaches and recent developments in the science of ecology and the skills for critically evaluating public issues related to ecology.

By the end of the course students will have an understanding of what ecology is, the types of primary questions ecologists attempt to address and the approaches they use. Students will be able to describe individuals, populations, and ecosystems in terms of their structure, function, adaptations and dynamics and will be aware of the main ecological determinants of the distribution and abundance of organisms. Students will appreciate the different approaches used to address ecological questions, such as those related to real world problems of disease control, deforestation and conservation of exploited species. They will also have an understanding of the importance of biodiversity, the reasons for its loss, and how ecological knowledge may be used to conserve biodiversity.

2. Underlying Principles

1. Ecology is the branch of science that studies the distribution and abundance of living organisms and the interactions between organisms and their environment.
2. Ecological systems may be examined at different levels of organization, from the individual through populations, communities, ecosystems, to the biosphere level. Ecology is a multi-disciplinary science, and draws on many other branches of science.
3. Application of ecological principles and knowledge is used to help solve real world problems, such as the impacts of forest loss and fragmentation from logging, calculating fishing quotas, and determining the most effective ways to protect species at risk.

3. Course Outcomes

Scientific Literacy

Communication Competence

Critical Thinking Ability

Ethical Foundations

By the end of the course you should:

1. show skills in critical thinking, the process of scientific enquiry, problem solving, group work, research methodology, and effective communication.
2. have developed a reasoned critical approach to published data, methodology and hypotheses, the ability to seek and source scientific information, and you will have written a scholarly research paper in which you have developed and supported your own ideas with information from current literature and other sources.
3. show competence when communicating ideas verbally, asking and answering questions during classes, and when working in teams to develop and deliver an oral presentation.
4. have gained an understanding of the relationship between structure and function of organisms, of how they interact with one another and with their physical environment.

5. have the necessary theoretical tools to solve problems, to explain ecological theories and to suggest hypotheses to address new issues.
6. recognize your own roles and responsibilities towards the physical and biological environment around you.

4. Evaluation and assignments

Case studies: presentation to class	10%
Case studies: report and literature review	20%
Class participation	5%
Mid-term exam	25%
Class quizzes	15%
Final exam	25%

1. 3 class quizzes will be held on three separate dates during the term: each quiz will account for 5% of the final mark. The professor will clarify the class material and assigned readings required the week prior to the quiz, which will be in the format of either a short-answer or problem-solving question.
2. 1 ecology case study assignment will be handed in over the term: this accounts for 20% of the final mark. In each case, students may select an article of interest (a collection of articles about current issues in ecology will be provided by the professor, or students may select their own topic, with approval by the professor). Students will prepare a scholarly paper in which they critique the article, integrating their own ideas with information from other current literature. Students will work in groups and present one critique to the class during the last two weeks of term.
3. Students will be evaluated for class participation, including class attendance, and for asking and answering questions during classes and student presentations.
 - Both mid-term and final examinations will consist of a mixture of multiple choice, short-answer and problem- solving exercises.

5. Textual

Required Text

1. The assigned text for this course will be R.L. Smith and T.M. Smith "*Elements of Ecology*" Fifth Edition, Benjamin Cummings, San Francisco.
 2. Some readings will also be taken from Campbell, Reece, Mitchell and Taylor "*Biology: Concepts and Connections*" Fourth Edition, Benjamin Cummings, San Francisco. The latter text will be used by students for the course Biol 102: Modern Biology.
 3. Current literature readings that are required for the course will be made available to students on the UCW website www.universitycanadawest.ca. Additional handouts and readings will be distributed during the term.
 4. Suggested journals of relevance for this course are: Bioscience, Canadian Journal of Zoology, Conservation Biology, Ecology, Evolution, New Scientist, Oikos, Science, Nature, Trends in Ecology and Evolution.
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5. Schedule

Lecture Material

All readings are from R.L. Smith and T.M. Smith "*Elements of Ecology*" Fifth Edition, unless otherwise stated.

Unit	Themes	Chapter	Pages
1. Introduction to Ecology	Our expectations of one another Note taking/exam preparation/ attendance Basic concepts	1	3-10

Unit	Themes	Chapter	Pages
	Scientific methods History of ecology		
2. Ecological Genetics	Genetic variation, Genetic and Reproductive isolation, Speciation and Extinction Adaptive radiation, Mass extinctions	2	11-33,198-200
3. The Organism and its Environment	The Abiotic and Biotic environment Energy transformations in Ecosystems Adaptations of Plants and Animals	3-8	51-53, 56-61, 64-75, 107-120, 138-163
4. Behavioural Ecology	Behavioural adaptations to the environment Ecological Roles of Behaviour Sociobiology	35 in Biology: Concepts and Connections	702-725
5. Population Ecology	Population density, distribution, age structure Life tables Population growth and regulation	9-11	172-183, 186-200, 204-215
6. Community Ecology	How organisms interact: Competition, Predation, Parasitism, Mutualism Community Succession Keystone species	13-15,17	242-266 270-277 280-284 290-296 330-336 340-345
7. Ecosystem Ecology	Trophic structure Nutrient cycling Ecosystem management Introduction to case studies: e.g. fish farming, deforestation, climate change, disease control	19-20	all
8. Biogeography and Biodiversity	Island biogeography Forest ecosystems Marine ecosystems Discussion of case studies	24,25,28	468-490 494-510 562-577

Unit	Themes	Chapter	Pages
9. Impacts on Terrestrial and Marine Ecosystems	Habitat degradation and fragmentation Water and air pollution Exotic species Discussion of case studies	19,23	356-362 368-386 450-460
10. Conservation Ecology	The Biodiversity Crisis Ecological Indicators Managing genetic resources Ecosystem restoration Discussion of case studies	38 in Biology: Concepts and Connections	764-783
11. Final review & Presentations	Final review of material prior to final examination Oral presentation of case studies by students		
12. Presentations & Final Exam	Oral presentation of case studies by students Final exam		

Students should also consult the website <http://www.campbellbiology.com>.