This syllabus is a general representation of the proposed course offering and is subject to change.

BIOL 314 / CONS 314 – Elements of Biodiversity

General Course Syllabus (as of January 2020)

About the Course:

Course Description: This course focuses on the units of biodiversity, from genes to ecosystems, how they are structured in space, and their importance to human well-being and ecosystem health. Topics explored include the origin and distribution of biodiversity, how biodiversity is defined and measured, how it varies in space and time, and how its loss impacts human societies. It will provide undergraduate students with a strong ecological and evolutionary basis to understand the natural causes and consequences of current global environmental changes.

The target audience will be students from Biology, Forestry, and Geographical Sciences, although interested students from any program are welcome to take the course, so long as they have taken an appropriate prerequisite course in major concepts of ecology.

Course Format: Lecture (three 1-hour lectures per week).
Credits: 3
Pre-requisites: One of APBI 260, BIOL 230, FRST 201, GEOB 207.

Course Learning Objectives:

By the end of this course, students will be able to:

- Describe the various elements of biodiversity and how they relate to one another.
- Calculate basic indices of biodiversity (e.g. Shannon's entropy, Jaccard Index, Hill Numbers Phylogenetic Diversity etc.).
- Explain the basic generating processes that support and structure biodiversity in space.
- Link elements of biodiversity to key ecosystem processes that support human health and well-being.
- Discuss the cultural, ecological, and economic value of biodiversity.
- List the major drivers of biodiversity decline and discuss the ultimate pressures on these drivers.
- Work together with a small group to prepare and deliver a presentation.
- Write a scientific paper following guidelines on format and structure, incorporating feedback from the draft into the final copy.
- Analyze and manipulate scientific data.

Textbooks and Additional Resources:

There is no required textbook for the course, but two books are suggested as recommended reading:

- *Biodiversity: An Introduction* by Gaston and Spicer, 2nd ed. (2004)
- *The Challenges of Biodiversity Science* by Loreau (2010)

Supplemental readings from the scientific literature will be assigned weekly with access provided through the course website.

Evaluation:

Assessment	Weight
Final exam – cumulative	40%
Written report	30%
Problem sets	15%
In-class presentations/discussion	15%

Final Exam: The final exam will be written during the final exam period. The exam will contain short answer questions, problem sets, and a short essay that will evaluate familiarity with the course contents, numerical skills, and the ability of students to synthesize information and form cogent arguments.

Written report: The written report will evaluate scientific writing skills. Each student will write an individual report based on one of the assigned problem sets during the term. Students will be given formal guidelines on how to format and structure a scientific paper, and will have the opportunity to receive feedback on a draft.

Problem sets: The problem sets will evaluate analytical skills. There will be three problems sets assigned during the term, which will be analyzed in class in small groups. Each student will then write up and submit results the following week as a short report, placing the findings in the context of the class lectures. Grades will be based on returning the correct numerical answers and identifying the appropriate concept(s) addressed by the analyses.

Participation/Discussion: Each week there will usually be time set aside to discuss assigned readings or analyze a problem set relevant to the lecture topic. Class participation/discussion will evaluate the ability of students to read and assimilate information from scientific papers, and give students confidence in presenting in front of an audience. Marks will be based on general contributions to the in-class discussions (5%) and on presenting key concepts of these assigned papers as an individual (5%) and in small groups (5%), for a total of 15% of the final course grade.

Schedule of Topics:

Broadly the course is divided into three sections: (1) the measurement and description of biodiversity, (2) the ecosystem functions and services provided by biodiversity, and (3) drivers and consequences of biodiversity change.

Tentative schedule of topics to be covered on a weekly basis:

Week	Lecture Topic	Activity
1	Introduction: getting the measure of biodiversity diversity [indices, species richness estimators, etc.]	
2	Biodiversity: concepts & measurement I (α diversity)	Problem Set
3	Biodiversity: concepts & measurement II (β, γ)	Problem Set
4	The inconvenient truth about species: species concepts	Discussion: Species concepts
5	Phylogenetic diversity	Discussion: What does phylogeny tell us?
6	Global diversity & biogeography	Discussion: Latitudinal gradients in species richness
7	Biodiversity & regulation of the Earth system	Discussion: Gaia concept
8	Biodiversity & ecosystem services	Discussion: Nature's contributions to people
9	Economic valuation of biodiversity	Discussion: How much is it worth?
10	Mass extinctions	Discussion: Are we in a 6th mass extinction?
11	Current Extinction drivers: habitat destruction, pollution, climate change, invasion, & over-exploitation	Problem Set **Practice exam**
12	Biodiversity policy, hotspots & global conservation priorities	Discussion: Future Earth

University Policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.

> *UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.*
>
> *UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.*
>
> *UBC values academic honesty and students ae expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.*

Details of the policies and how to access support are available on the UBC Senate website.