

# BI 212 : PRINCIPLES OF BIOLOGY

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## Transcript title

Principles of Biology

## Credits

5

## Grading mode

Standard letter grades

## Total contact hours

70

## Lecture hours

40

## Lab hours

30

## Prerequisites

BI 211.

## Course Description

Emphasizes transformations of energy and matter, systems level biology, and the structure and function of ecosystems. Studies the interrelationships between all forms of life and their environment.

Emphasizes aspects of plant morphology and physiology that influence ecosystem function. Designed for majors in life sciences as well as those pursuing botany. Field Trips may be required.

## Course learning outcomes

1. Use multiple representations to model the relationships between species/population abundance and distribution in relation to biotic and abiotic factors.
2. Describe the flow of energy and the cycling of matter in ecosystems in the biosphere at human and geologic time scales.
3. Explain how biotic and abiotic interactions influence and are influenced by morphological, physiological and behavioral traits.
4. Generate questions, construct testable hypotheses about biological mechanisms based upon observations of the natural world, and effectively communicate experimental outcomes using professional scientific formats.
5. Apply quantitative skills to biological problems including interpreting charts and graphs, applying mathematical and algebraic concepts to biology, and identifying trends in data.
6. Reflect on the impact of biological research on society.

## Content outline

1. Oregon ecosystems
2. Tropic pyramids and energy flow through ecosystems
3. Bacterial metabolic pathways nutrient cycles
4. Decomposition and fungi
5. Protist diversity, aquatic food webs, and the tree of life
6. Photosynthesis and primary production
7. Plant anatomy and physiology of water and sugar transport
8. Evolution of plants onto land
9. Plant reproduction and co-evolution with animal pollinators
10. Climate factors and biogeography of biotic communities

11. Aquatic ecosystems and pollution
12. Population ecology and species interactions
13. Major ecological principles underlying biotic community dynamics
14. Carbon cycling and climate change
15. Responses of ecosystems, communities, and populations to environmental change

## Required materials

May require access to a computer and internet, a textbook and/or coursepack.

## General education/Related instruction lists

- Science Lab