



## BIOL 112 - Introduction to Ecology Course Outline

Approval Date: 03/12/2020

Effective Date: 06/08/2020

### SECTION A

**Unique ID Number** CCC000304568

**Discipline(s)** Biological Sciences

**Division** Science and Engineering

**Subject Area** Biology

**Subject Code** BIOL

**Course Number** 112

**Course Title** Introduction to Ecology

**TOP Code/SAM Code** 0401.00 - Biology, General / E - Non-Occupational

**Rationale for adding this course to the curriculum** Add Distance Education options; update textbook; add discipline; add degree/transfer applicability

**Units** 3

**Cross List** N/A

**Typical Course Weeks** 18

**Total Instructional Hours**

#### Contact Hours

**Lecture** 54.00

**Lab** 0.00

**Activity** 0.00

**Work Experience** 0.00

**Outside of Class Hours** 108.00

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**Total Contact Hours** 54

**Total Student Hours** 162

**Open Entry/Open Exit** No

**Maximum Enrollment**

**Grading Option** Letter Grade or P/NP

**Distance Education Mode of** On-Campus

**Instruction** Hybrid

Entirely Online

Online with Proctored Exams

### SECTION B

**General Education Information:**

### SECTION C

**Course Description**

**Repeatability** May be repeated 0 times

**Catalog Description** This course explores basic principles of ecology and environmental biology, including study of major biomes and habitat types, biological diversity, interactions of organisms with the physical environment, plant and animal interactions, nutrient cycling and energy flow in ecosystems, and the interdependence of organisms in biological communities. The role of humans in the environment will also be examined. This is an introductory course for science majors as well as non-majors.

**Schedule Description**

**SECTION D**

**Condition on Enrollment**

- 1a. **Prerequisite(s):** *None*
- 1b. **Corequisite(s):** *None*
- 1c. **Recommended:** *None*
- 1d. **Limitation on Enrollment:** *None*

**SECTION E**

**Course Outline Information**

**1. Student Learning Outcomes:**

- A. Apply qualitative models that describe population growth and dynamics.
- B. Describe and compare competitive interactions between two species.

**2. Course Objectives:** Upon completion of this course, the student will be able to:

- A. Apply methods of science and scientific investigation to ecological studies.
- B. Discuss the history of the discipline, including the science of ecology, conservation, environmentalism, and the development of environmental ethics.
- C. Understand the basic principles of ecology and evolution.
- D. Relate the basic climatic, physiographic, chemical and biotic processes of the biosphere to the distribution of species.
- E. Describe ecosystem structure and function including trophic structure (eg. food webs), productivity, and mineral cycles.
- F. Explain community dynamics, including factors influencing the distribution of organisms, species diversity and dominance, vegetation ecology, niche, species interactions and ecological succession.
- G. Investigate population dynamics, including patterns of distribution and dispersal, age structure, and growth.
- H.

**3. Course Content**

- A. Ecology as science: Scientific approaches to problems
- B. Environmental law
  - a. History of ecology
  - b. U.S. environmental legislation
- C. Economics and ecology
- D. Environmental ethics
- E. Evolution
  - a. Natural selection
  - b. Plant and animal adaptations to the environment
- F. Major Biomes
- G. Biological communities including habitats and niches
- H. Interactions between organisms

- I. Energy flow through ecosystems including trophic levels
- J. Cycling of material within ecosystems, including the carbon cycle and the nitrogen cycle.
- K. Environmental health issues
- L. Pollution
- M. Principles of population ecology
  - a. Logistic population growth
  - b. Reproductive strategies
  - c. Carrying capacity
- N. Management of natural resources including energy and water
- O.

#### 4. Methods of Instruction:

**Activity:**

**Discussion:** Group discussion of relevant research and topics

**Lecture:** Lecture covering topics in course content with images

**Online Adaptation:** Activity, Discussion, Journal, Lecture

**4. Methods of Evaluation:** Describe the general types of evaluations for this course and provide at least two, specific examples.

#### Typical classroom assessment techniques

Exams/Tests -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Quizzes -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Research Projects -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Papers -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Home Work -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Final Exam -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Mid Term -- 1. Homework assignments 2. Midterm and final exams Example 1: Draw a food web containing organisms in a Napa County fresh water pond. Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Additional assessment information:

1. Homework assignments
2. Midterm and final exams

Example 1: Draw a food web containing organisms in a Napa County fresh water pond.

Example 2: Midterm exam will cover topics including significant events in environmental law, principles of natural selection, and food webs.

Letter Grade or P/NP

**5. Assignments:** State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

Reading assignments from textbooks and from relevant news articles and scientific journals.

Example 1: Read chapters 4 and 5 from textbook to prepare for lecture on ecosystems

Example 2: Read journal article from "Science" concerning global climate change

B. Writing Assignments

Homework assignments

Attendance of public meetings

Example 1: Attend a city council meeting

Example 2: Review the research concerning global climate change and write a report discussing the impact on human populations around the world.

C. Other Assignments

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**6. Required Materials**

**A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.**

Book #1:

Author: Relyea, R., R. Ricklefs.

Title: Ecology: The Economy of Nature

Publisher: Macmillan

Date of Publication: 2018

Edition: 8th

**B. Other required materials/supplies.**