



Syllabus

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Co-requisites

None

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category

None

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Inquiry, Perseverance, and Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Explain ecological concepts using appropriate terminology.
2. Apply ecological concepts to explain observed patterns (spatial and temporal) in community structure and function.
3. Practice technical writing skills.
4. Integrate information from appropriate sources (primary and secondary).

Outline of Topics Covered

- I. Introduction to Ecology
 - I. Definition
 - II. Hierarchical Levels of Ecology
 - III. Scientific method
 - IV. Observation/Manipulative experiments
 - V. Data and Graph interpretation
- II. Climate
 - I. Global Climate Patterns (e.g. Hadley Cells, Coriolis Effect, Thermohaline Circulation)

- II. Regional Climate Modifications (e.g. elevation, aspect, lake effect snow, orographic effect, upwelling, monsoons, etc.)
- III. Soils
 - I. Soil Forming Factors
 - II. Soil Horizons
 - III. Soil Texture and Properties
- IV. Aquatic Systems
 - I. Water's Chemical and Physical Properties (e.g. covalent and hydrogen bonds, polarity, viscosity, cohesion, etc.)
 - II. Lentic vs. Lotic
 - III. Stream Orders
 - IV. Seasonal Stratification and Mixing
 - V. Eutrophic vs. Oligotrophic
 - VI. Vertical and Horizontal Zones
- V. Community Ecology
 - I. Community Composition and Structure
 - II. Relative Abundance
 - III. Species Diversity Concepts and Equations
 - IV. Succession
 - V. Individualistic (Gleason) vs. Closed (Clements) Community Models
- VI. Biomes
 - I. Characteristic Climatic
 - II. Edaphic and Biological Properties of Eight Major Biomes (i.e. tropical rainforests, deserts, savannah, chaparral, temperature deciduous forest, temperate grassland, taiga, and tundra)
- VII. Evolution
 - I. Mechanisms of Evolution (Natural Selection, Mutations, Selective Mating, Migration, Genetic Drift)
 - II. Eco-Types
 - III. Phenotypic Plasticity
- VIII. Plant & Animal Adaptations
 - I. Autotrophs vs. Heterotrophs
 - II. Photosynthesis (light reaction and Calvin Cycle)
 - III. Photosynthetic Pathways (C_3 , C_4 , CAM)
 - IV. Plant and Animal Adaptations in Response to Different Selective Pressures (e.g. low light, low oxygen, low moisture, hot/cold temperature)
 - V. Different Animal Adaptations for Energy and Nutrient Consumption (i.e. feeding strategies and digestive tracts) and Maintaining Homeostasis (e.g. ectothermy vs. endothermy)
- IX. Life History Traits
 - I. Sexual vs. Asexual
 - II. Sexual Forms (i.e. monoecious, dioecious, synoecious)

- III.** Mating Systems (e.g. monogamy, polygamy)
 - IV.** Intrasexual Selection vs. Intersexual Selection
 - V.** Altricial vs. Precocial
 - VI.** R-Selection vs. K-Selection Strategies
- X.** Population Ecology
 - I.** Properties of Populations
 - II.** Population Growth Models (i.e. exponential and logistics)
 - III.** Intraspecific Population Regulation Dynamics
- XI.** Species Interactions
 - I.** Types of Species Interactions
 - II.** Fundamental vs. Realized Niche
 - III.** Interspecific Competition
 - IV.** Predation