Biology 31 Study Guide
Species Interactions and Community Ecology

Reading:
- Withgott and Brennan, "Essential Environment", Chapter 5

Key Terms:
- mutualism
- mimicry
- non-native species
- climate diagram, climatograph
- symbiosis
- community ecology
- natural disturbances
- temperate deciduous forest
- exploitative interactions
- tropic levels
- perturbation
- temperate grassland
- predation
- food chain, food web
- resistance
- temperate rainforest
- parasitism
- primary consumer
- resilience
- tropical rainforest
- herbivory
- secondary consumer
- primary succession
- tropical dry forest
- intraspecific competition
- tertiary consumer
- secondary succession
- savanna (tropical grassland)
- interspecific competition
- detritivore
- pioneer species
- desert
- resource partitioning
- decomposer
- lichen
- tundra
- competitive exclusion
- keystone species
- primary aquatic succession
- boreal forest or taiga
- cryptic coloration
- ecosystem engineers
- ecological restoration
- chaparral
- warning coloration
- invasive species
- biome
- aquatic systems

Study Objectives:
- Be able to define and give examples of the following types of species interactions: competition, exploitative interactions (predation, parasitism, and herbivory) and mutualism.
- Which type of exploitative interaction between species is most common?
- What group of organisms is the most widespread herbivore?
- Distinguish between intraspecific and interspecific competition.
- What is resource partitioning and how does competition promote it? Be able to give examples.
- How can predation drive population dynamics? Provide a graphical representation.
- Give examples of defensive adaptations of prey against being eaten.
- Describe how hosts and parasites engage in an evolutionary "arms race".
- Give examples of some of the defenses plants have acquired to keep from being eaten.
- Give examples of symbiotic and nonsymbiotic mutualisms (mutualism between free-living organisms). Describe at least one way in which mutualisms affect your daily life.
- What is an ecological community? What do community ecologists study?
- What are trophic levels? Understand how biomass, the number of organisms, and energy flow changes at higher trophic levels.
- Describe how the transfer of energy between trophic levels demonstrates why the ecological footprint of a vegetarian is smaller than that of a meat eater.
- Distinguish between producers (or autotrophs) and consumers (or heterotrophs) in a food chain or food web.
- Differentiate between a food chain and a food web. Which best represents the reality of communities and why?
- What are detritivores and decomposers? Give examples. Understand their importance as community recyclers making nutrients available for reuse by living organisms.
- Be able to identify trophic levels in a food web.
- What is meant by a keystone species, and what types of organisms are often considered keystone species?
- Describe how otters, mountain lions, wolves, and starfish are examples of keystone species.
- What are ecosystem engineers? Give an example.
- What is meant by an invasive species? How are they able to become dominant in a community? Give examples of intentional as well as accidental introductions of invasive species.
- Describe the invasion of the Great Lakes by the zebra mussel. How were they introduced? How did they thrive and spread? Describe the research evidence that demonstrates their effects on the structure of the freshwater ecosystems they invaded as well as their economic impact.
- How can ecological communities respond to disturbances? Distinguish between resilience and resistance.
- Define succession. Distinguish between primary succession and secondary succession. Describe the arrival of pioneer species and other organisms.
- What are lichens and how are they important in primary succession?
- Describe primary aquatic succession.
- Can damaged ecosystems recover? Describe the recovery rates that have been demonstrated for terrestrial versus aquatic ecosystems. For those ecosystems that showed evidence of recovery, what perturbations resulted in the longest recovery times?
- What is ecological restoration? Give examples of restoration projects in the United States.
- What is a biome? What factors most strongly influence the type of biome that forms in a particular place on land?
- Be able to recognize the types of vegetation and organisms that would be found in the ten terrestrial biomes. Understand their corresponding climate diagrams.
- How does vegetation change with increasing elevation and latitude?
- Know that aquatic systems show biome-like pattern. Be able to give examples of freshwater, ocean, and coastal systems. What factors determine the type of aquatic system that may form in a given location?