

Learning Goals and Objective – Final Unit = Ecology

Recorded lectures for all chapters are available online through YuJa. Access is in Blackboard, and should show up under the “Tools” tab, but I have provided direct links below for the study guide/portfolio. There is a power point that (mostly) follows posted in Blackboard as well if you want to take notes for yourself. You can use these links by clicking the following:

Intro to Ecology -

<https://und.yuja.com/V/Video?v=357749&node=1701173&a=1334668591&autoplay=1>

An Introduction to Ecology:

LEARNING GOALS-

1. Appreciate the characteristics and distribution of earth’s major biomes
2. Understand basic global climate concepts

LEARNING OBJECTIVES-

1. Explain what “ecology” refers to – *by giving me definition and/or summary*
2. Explain the factors that determine the global distribution of biomes – *by locating and inserting a graph that shows the relationship between temperature and precipitation related to the biomes on earth.*
3. Describe the distinguishing features of the following biomes: tropical wet forest (rainforest); deserts; temperate grasslands; temperate forests; boreal forests; tundra – *by creating a table that lists and describes each. Additionally, locate and insert a map WITH A LEGEND that shows the distribution of these biomes around the globe.*
4. Describe the seasonal stratification and turnover that occurs in lakes in temperate regions *by locating and inserting a diagram or image that illustrates this process AND providing a summary of it that you add on your own (consider inserting a text box or two and some arrows).*
5. Explain why we experience seasons – *by using an image of your choice (more than one is fine) and inserting a text box or two to show how/why earth has seasons in the two hemispheres.*
6. Explain why the tropics are hot and rainy. *You can do this by adding to the image above*
7. Explain the “rain shadow” effect – *by inserting an image AND adding text of your own to explain the illustration.*
8. ****Compare and contrast biotic and abiotic factors using a Venn Diagram.**

Behavioral Ecology -

<https://und.yuja.com/V/Video?v=357753&node=1701177&a=337796222&autoplay=1>

Behavioral Ecology:

LEARNING GOALS-

1. Understand innate behaviors and learned behaviors.
2. Understand the constraints that animals deal with on a regular basis and ways in which they deal with those constraints.

LEARNING OBJECTIVES-

1. Explain and give examples of fixed action patterns *by defining what one is and giving 3 examples.*
2. Distinguish between proximate cause and ultimate causation *by defining each, and then comparing and contrasting them using a Venn Diagram*
3. Describe some examples of learning in animals including imprinting, classical conditioning, and thinking *by defining each and giving 2 examples of each.*
4. Explain the concept of optimal foraging theory *by defining what it is and then giving an example – NOTE you may need a diagram or illustration – graphs are VERY helpful in understanding this – focus on one that shows 2 organisms competing for resources.*
 - a. Make sure to describe how foraging decisions maximize energy gain and minimize costs
5. Explain how mate choice plays a role in reproductive success *by providing an example.*
6. Describe the components of migration including: piloting, orientation, and navigation *by defining each of these and how they work together to help animals migrate.*
7. Describe the ways in which animals communicate including the roles of: visual and sound cues; pheromones; round dance and waggle dance; and deceitful communication *by defining each and giving an example.*
8. Explain how altruistic behavior can be an effective way for an organism to pass on its genes to future generations *by defining what this is and giving one example.*

Population Ecology -

<https://und.yuja.com/V/Video?v=357736&node=1701160&a=1929148504&autoplay=1>

Population Ecology:

LEARNING GOALS-

1. Understand how biologists study populations.
2. Be familiar with human population growth on a global scale.

LEARNING OBJECTIVES-

1. Explain what “population” refers to *by providing a definition of this term.*
2. List and describe the important characteristics of populations *by creating a table that summarizes the points from the book.*
3. Differentiate between types I, II, and III survivorship curves *by locating and inserting an image that shows all three.*
4. Use the “mark-recapture” approach to estimate population size – *to do this give me a series of images and annotate them to show what is being done, and how/why it is being done to estimate a population.*
5. Differentiate between the exponential and logistic models of population growth *by providing TWO images – one of each, then explaining where competition is greatest, and where resources are most abundant.*
6. Identify and explain the concept of “carrying capacity” *by noting where it is on the logistic growth curve you inserted for 5 above.*
7. Distinguish between density-independent and density-dependent population growth factors *by defining these terms and then providing 3 examples of each.*
8. Identify the approximate number of people on earth (and estimate how long it may take for the population to double in size) *by adding a graph of human population growth over time, AND one that shows the expected rates of increase.*
9. ****Define what a life table is, insert an image showing at least one, and then add text boxes to explain what inferences can be made based on life tables and why.**
10. **** Explain the link between understanding population dynamics and applying the data to endangered species.**

Community Ecology -

<https://und.yuja.com/V/Video?v=357750&node=1701174&a=1839333320&autoplay=1>

Community Ecology:

LEARNING GOALS-

1. Understand the ways that organisms interact with each other in the natural environment.
2. Understand how factors such as size and location of habitat influence the number of species found in a given area.

LEARNING OBJECTIVES-

1. Explain what “community” refers to *by defining it and providing at least one example.*
2. Distinguish between fundamental and realized ecological niche *by defining each and then creating a Venn Diagram to compare and contrast them – the definition can be in the Venn Diagram.*
3. Explain the competitive exclusion principle *by defining it, giving an example, and locating and inserting an image that supports your explanation (you may need more than one).*
4. Describe the types of interactions among species including competition, plant and animal defense mechanisms, and mimicry (Batesian and Müllerian) *by creating a table that defines each (one column) describes each (another column). Use a Venn Diagram to compare and contrast Batesian and Mullerian mimicry.*
5. Explain the “keystone species” concept *and provide an illustrative example – a picture will be fine. THEN define what “top down” versus “bottom up” regulation is, and PICK ONE that you think is more accurate/appropriate and explain why.*
6. Explain the equilibrium model of island biogeography including the relationships between island size, distance from mainland, colonization rates, and extinction rates on maintaining an equilibrium number of species on an island. *You determine the best way to accomplish this – I think at least one image will be needed to do it well.*
7. ****Explain why an assemblage of species in a biological community changes over time.**
8. ****Define species richness AND species diversity, then explain why richness is higher in the tropics and lower at the poles.**
9. **** Explain why species richness is higher on large islands near a mainland than on small, isolated islands.**

Ecosystems and Global Ecology -

<https://und.yuja.com/V/Video?v=357737&node=1701161&a=221005574&autoplay=1>

Ecosystem and Global Ecology:

LEARNING GOALS-

1. Understand global geochemical cycles.
2. Understand the change in available energy at progressively higher trophic levels.
3. Understand major environmental concerns.

LEARNING OBJECTIVES-

1. Describe the global carbon cycle *by inserting an image of the carbon cycle and then using that image to tell me about the movement of carbon from inorganic sources, through living things, and back to inorganic sources again. **NOTE- for 1-3 you should include what major macromolecules these elements are found in.***
2. Describe the global nitrogen cycle (including the role of bacteria) *by inserting an image of the nitrogen cycle and then using that image to tell me about the movement of nitrogen from inorganic sources, through living things, and back to inorganic sources again..*
3. Describe the global phosphorous cycle *by inserting an image of the that cycle and then using that image to tell me about the movement of phosphorous from inorganic sources, through living things, and back to inorganic sources again..*
4. Explain the problems when excess phosphorous and nitrogen make their way into ecosystems (including the concept of “dead zones”) *by inserting an image of the issue and then explaining the problem.*
5. Describe the various trophic levels that comprise food webs *by inserting at least one terrestrial AND one aqueous food WEB (not a chain) and labeling primary producers, primary consumers, secondary, tertiary, and quaternary consumers. Finally, use your image to explain WHY or HOW a single organism can occupy multiple levels.*
6. Explain the concept of “ecological pyramids” *using the image(s) you select in 5 above – make sure you address the amount of energy/biomass at or in each level.*
7. Explain the concept of “trophic cascade” *again using the image(s) you selected for 5 and used for 6 above.*
8. ** Explain how energy flows from producers to consumers and decomposers in a food web *using your image from 5.*
9. **Compare and contrast the flow of energy and nutrients *by using your image from 5 to create a Venn diagram comparing and contrasting the flow of energy and nutrients. MAKE SURE you explain the direction of arrows in your diagram.*
10. Explain why the use of DDT is problematic (including the concept of “biological magnification”) *by using your image from 5 to illustrate where/how and why top predators tend to bioaccumulate more toxins like DDT.*

11. Describe the greenhouse effect and identify greenhouse gasses *by defining it, inserting an image of the buildup of AT LEAST 1 greenhouse gas, and showing the effect/correlation with temperature over time using a graph or image you locate.*
12. Identify some of the evidence and implications of global climate change *however you find effective (I am leaving this up to you).*
13. Explain the important role of ozone and the cause of the ozone “hole” over Antarctica *however you find effective.*