UNIVERSITY OF SOUTH FLORIDA
A PREEMINENT RESEARCH UNIVERSITY

PCB 3043L
Principles of Ecology Lab

College of Arts & Sciences, Integrative Biology

Topic	Learning Outcomes
Methods in Ecology I: Science Communication	1. Characterize the key components of the scientific method in a peer-reviewed article (e.g., hypotheses, methodology, main findings). 2. Communicate these key components to a non-scientific audience by using Interpretation.
Methods in Ecology II: Data Analysis	1. Generate and test scientific hypotheses based on provided ecological background information and data. 2. Analyze provided datasets utilizing descriptive statistics for center and spread. 3. Construct at least two figures and at least one table that are clear and readable.
Coping with Environmental Variation	1. Identify ways organisms cope with variation in their physical environment. 2. Describe a physiological tolerance curve. 3. Estimate the tolerance limit of red mangrove seedlings to tidal inundation. 4. Describe biological responses of red mangrove seedlings along an inundation gradient. 5. Explain how frequency of inundation shapes tidal wetland plant communities.
Evolution & Adaptation	1. Describe how organisms in a population adapt to their environment through natural selection. 2. Differentiate between the mechanisms of evolutionary change and how they each alter allele frequency in a population. 3. Analyze data related to evolutionary change in a population. 4. Apply the concepts of evolution and adaptation to understand the implications of global threats such as climate change.
Population Growth	1. Identify density-dependent and density-independent factors influencing *Gopherus polyphemus* (Gopher tortoises) during different age classes. 2. Generate and test scientific hypotheses based on provided ecological background information and data 3. Analyze provided data utilizing descriptive statistics and figures that relate to your generated hypotheses.

Population Demography	1. Differentiate between r and k life history strategies including the benefits and disadvantages of each. 2. Construct survivorship and reproduction tables based on provided demographic information 3. Estimate and describe life history features including net reproductive rate and intrinsic rate of increase 4. Test hypotheses to determine how environmental conditions may affect plant life histories and present their results to one of their peers
Spatial Dispersion	1. Describe the three types of species distributions that organisms can exhibit and infer the abiotic and biotic interactions that may influence why species exhibit each distribution type. 2. Calculate the spatial distribution of an example species, the southern live oak, using different field-sampling techniques and matching statistical analyses. 3. Determine how spatial scale influences dispersion patterns when using field-sampling techniques and spatial analysis tools.
Species Interactions	1. Identify and describe different types of species interactions. 2. Explain how species interactions affect population demography. 3. Predict how species interactions could alter community structure through both direct and indirect effects
Community Ecology Part I	1. Describe key concepts like ecological succession and the intermediate disturbance hypothesis 2. Explain how environmental gradients and disturbance patterns influence plant community structure/succession 3. Evaluate how sampling procedures influence measurements of plant community structure.
Community Ecology Part II	1. Explain how environmental gradients and disturbance patterns influence plant community structure and biodiversity. 2. Recognize the two aspects of species diversity and use both species richness and abundance data to calculate diversity indices. 3. Describe how scale influences observations of species richness.
Ecosystems Ecology	4. Identify key terminology about ecosystem and restoration ecology. 5. Determine how long it takes tidal wetlands in Tampa Bay to mirror natural sites in terms of their ecosystem structure and function using statistical analyses in Excel. 6. Make informed recommendations as to the value of tidal wetland restoration.