BIOL 121 TARGETED READINGS – ECOLOGY UNIT

3rd Canadian ed. - Whiskey jack on cover (pages below are for the hard copy)	2019 UBC custom ed. – Frog on cover	2014-2018 UBC custom ed. – Steller's Jay on cover
INTRODUCTION TO ECOLOGY		

Chapter 49: An Introduction to Ecology (1084+)
• Introduction
• 49.1 Levels of Ecological Study
• 49.2 What determines the distribution and abundance of organisms
	An Introduction to Ecology (356+)
	• Introduction
	• 1 Levels of Ecology
	• 2 What Determines the Distribution and Abundance of Organisms
		Chapter 50: An Introduction to Ecology (1088+)
		• Introduction
		• 50.1 Levels of Ecological Study
		• 50.5 Biogeography: Why Are Organisms Found Where They Are?
		  ○ Abiotic Factors
		  ○ Biotic Factors

POPULATION ECOLOGY		

Chapter 51: Population Ecology (1130+)
• Introduction
• 51.1 Distribution and Abundance
• 51.2 Demography
  ○ Introduction
  ○ Life Tables > Survivorship
  ○ The Role of Life History
• 51.3 Population Growth (all)
	Population Ecology (408+)
	• Introduction
	• 1 Distribution and Abundance
	• 2 Demography:
	  ○ Introduction
	  ○ Life Tables > Survivorship
	  ○ The Role of Life History
	• 3 Population Growth (all)
		Chapter 52: Population Ecology (1141+)
		• Introduction
		• 52.1 Demography
		  ○ Introduction
		  ○ Life Tables > Survivorship
		  ○ The Role of Life History
		• 52.2 Population Growth (all)

COMMUNITY ECOLOGY		
Chapter 52: Community Ecology (1160+) • Introduction • 52.1 Species Interactions (NOT the section on defences) • 52.3 Community Dynamics	Community Ecology (436+) • Introduction • 1 Species Interactions (NOT the section on defences) • 3 Community Dynamics	Chapter 53: Community Ecology (1166+) • Introduction • 53.1 Species Interactions (not section on defences) • 53.3 Community Dynamics
ECOSYSTEM ECOLOGY		
Chapter 53: Population Ecology (1130+) • Introduction • 53.1 How Does Energy Flow through Ecosystems (not Biomagnification or Global patterns in productivity)	Ecosystems and Global Ecology (466+) • Introduction • 1 How Does Energy Flow Through Ecosystems (not Biomagnification or Global patterns in productivity)	Chapter 54: Ecosystems (1193+) • Introduction • 54.2 How Does Energy Flow through Ecosystems? (not Trophic Cascades,

• 53.2 How Do Nutrients Cycle through Ecosystems
  ○ Introduction
  ○ Global Nitrogen Cycle
  ○ Global Carbon Cycle
	• 2 How Do Nutrients Cycle through Ecosystems
	  ○ Introduction
	  ○ Global Nitrogen Cycle
	  ○ Global Carbon Cycle
		Biomagnification or Global Patterns in Productivity)
		• 54.2 How Do Nutrients Cycle through Ecosystems?
		  ○ Introduction
		  ○ Global Nitrogen Cycle
		  ○ Global Carbon Cycle

LEARNING OBJECTIVES

Ecology		
Course Goals	**Broad Student Outcome**	**Specific Student Outcome**
E. Evaluate and make predictions about the abundance and distribution of populations and communities over different time scales.	**E1** Identify and evaluate how abiotic, biotic (including human), stochastic and historical factors can influence species distribution patterns and population size.	**FOR ALL ECOLOGY: Describe** or **summarize** in words key features of experimental or observational data from figures or tables. *Given a scenario…* **E1-1 Identify** the abiotic factors that are most likely to affect the distribution and abundance of a species of interest. **E1-2 Describe** types of species interactions and their effects on the fitness. **E1-3 Identify** the type(s) of interaction(s) between species and **justify** your conclusion with evidence and clear reasoning. **E1-4 Identify** the fundamental or realized niche of one or more species and **justify** your conclusion with evidence and clear reasoning. **E1-5 Explain** how species interactions affect the niche occupied by a species and **justify** your conclusion with evidence and clear reasoning
	E2 Predict how species distribution or population size might change in response to changes in abiotic and biotic (including human) factors.	*Given a scenario…* **E2-1 Predict** how biotic, abiotic or stochastic factors are likely to affect the distribution or abundance of a species and **justify** your conclusion with evidence and clear reasoning. **E2-2 Identify** resources that are likely limiting in a particular environment, **predict** how altering resource availability may affect species and **justify** your conclusion with evidence and clear reasoning. **E2-3 Propose** possible outcome(s) of competition both in the short term and over evolutionary timescales and **provide** a reasoned justification for your proposal. **E2-4 Predict** how invasive species could affect native species within a community.
	E3 Using mathematical models and biological concepts explain and predict how demographic patterns, species life history traits, and population dependent and independent factors affect population growth rate.	*Given a scenario…* **E3-*** Be able to estimate population size using the Lincoln-Peterson Index. **E3-1 Draw** or **identify** the correct type of survivorship curve for a species. **E3-2 Describe** life history traits associated with different types of survivorship curves and how trade-offs constrain life histories in organisms. **E3-3 Identify** logistic and exponential growth. **E3-* Identify** specific abiotic and biotic factors that may affect birth rates, death rates in a population. **E3-4 Explain** how density dependent and density independent factors affect population growth. **E3-5 Identify** when a population has reached carrying capacity. **E1-6 Identify** or **describe** or **explain** how changes in habitat quality, habitat size or other features of the environment affect carrying capacity.

	E4 Predict how changes in abiotic or biotic factors or disturbances can affect patterns of succession and community composition over various time scales.	**E4-1 Describe** types of disturbance, severity and frequency. **E4-2 Describe** general characteristics of types of species found at different successional stages in a forest biome (e.g. dispersal ability, competitive ability). **E4-3 Describe** patterns of succession following a major disturbance (e.g. fire) in a temperate forest biome from early to late successional stages. **E4-4 Explain** the processes responsible for change in species composition of a forest biome from disturbance to climax community. **E4-5** Given a scenario, **identify** the successional stage of a community. **E4-6 Predict** and **explain** how disturbance will change resource availability and abiotic conditions in a location and how these changes will affect community composition.
F. Explain the roles and interactions among individuals, populations, communities and abiotic factors in building and changing an ecosystem.	**F1** Identify and describe relevant interactions between pairs of species within a community in terms of the fitness impacts that each species has on the other.	*Given a scenario…* **F1-1 Predict** the type of interactions among species and the fitness effects for each species, **justifying** with evidence and clear reasoning.
	F2 Identify the trophic level and energy sources of an organism based on information about organisms present in an ecosystem.	*Given a scenario…* **F2-1 Construct** a food web or food chain, including links to the detritus food chain or food web. **F2-2 Identify** the trophic level or levels for each organism.
	F3 Describe the flow of energy and nutrients though a food web or ecosystem and predict the consequences of changes to these systems at the level of species and whole ecosystems.	**F3-1 Diagram** the movement of carbon and nitrogen through a food web including movement to and from inorganic, unfixed or atmospheric pools. **F3-2** Given a scenario, **predict** how the addition or removal of nutrients could affect productivity or organism biomass and **justify** with evidence and clear reasoning.
	F4 Explain how human effects or other disruptions to nutrient cycling can alter ecosystems.	**F4-1 Describe** how humans have affected global biogeochemical cycles (carbon, nitrogen). **F4-3 Describe** evidence for the effect of humans on species abundance and distribution.