

**Assigned reading: Smith & Smith (S&S), Freeman 3<sup>rd</sup> (F), Carroll (C)**

**Course Introduction (1 lecture)**

S&S 2-18, F 1-17, 1125-1127  
C ix-xi, C 2-3

**Unit I. Evolution and Behavioral Ecology**

- 11 Lectures
- A. Genetic Variation
  - B. Natural Selection
  - C. Individual Selection and Group Selection
  - D. Outbreeding vs. Inbreeding
  - E. Genetic Drift – Minimum Viable Populations
  - F. Mating Systems and Sexual Selection
  - G. Reproductive Isolation and Speciation
  - H. Adaptive Radiation, Macro-evolution, and Phylogeny
  - I. Coevolution, Mutualism versus Antagonism
  - J. Extinction and the Extinction Crisis
- S&S 356-380, F 481-502  
F 503-525, 526-542, 1167-1170  
S&S 214-222, 306-334, C 4-35  
C 36-51, 112-131

**Unit II. Systematic Biology**

F 543-565

- 3 Lectures
- A. Biodiversity
  - B. Taxonomic Method
  - C. Phenetics
  - D. Cladistics

**FIRST-HOUR EXAMINATION – Wednesday, February 18, 2009**

**Unit III. Adaptations to the Physical Environment**

S&S 20-56, 80-144  
S&S 543-559

- 5 Lectures
- A. Solar Radiation, Temperatures, and Climates
  - B. Water and Nutrients
  - C. Plant and Animal Adaptations to Environment
  - D. Biogeography

**Unit IV. Population Growth and Regulation**

S&S 160-213, 222-236

- 5 Lectures
- A. Life Tables
  - B. Population Structure and Growth
  - C. Life History Patterns – r- & K-selection, Bet-hedging
  - D. Intraspecific Competition
  - E. Population Regulation: Density-dependent vs. Density-independent Regulation

**Unit V. Population Interactions**

S&S 242-305

- 5 Lectures
- A. Interspecific Competition
  - B. Niche Theory
  - C. Predator-Prey Relations
  - D. Controls on Population Size – Bottom-up Versus Top-down

**SECOND-HOUR EXAMINATION – Friday, April 3, 2009**

**Unit VI. Community Ecology**

S&S 381-476

- 5 Lectures
- A. Community Structure
  - B. Community Dynamics
  - C. Significance of Species Diversity
  - D. Stability and Diversity
  - E. Succession
  - F. Landscape Ecology

**Unit VII. Ecosystem Structure and Function**

S&S 145-158, 335-354  
S&S 478-542, 699-720

- 5 Lectures
- A. Ecosystem Productivity
  - B. Trophic Structure and Energy Flow
  - C. Biogeochemical Cycles
  - D. Global Cycles and Human Impacts
  - E. Global Environmental Change
  - F. Ecological Footprint