

Modified Outline for Test 2 FS 02 (numbers are sections from the textbook)

III-Population Ecology

A. Population Demography

1. Density 9.3, 9.4
 - a) Crude density
 - b) ecological density
2. Natality 10.5, 10.6
 - a) maximum natality
 - b) realized natality
 - c) natality rate
 - crude
 - specific
3. Mortality 10.1, 10.2, 10.4, 10.7, 10.8
 - a) death rate
 - b) probability of dying
 - c) life tables
 - dynamic life tables
 - time specific life tables
 - c) survivorship curves
4. Age structure 9.8, 9.9, 9.10

B. Population dynamics

1. Population growth 10.7
2. Population growth potential 10.8
 - a) annual finite rate of increase
3. Growth patterns
 - a) Malthusian principles
 - b) Exponential growth equation 10.9
 - c) Exponential growth curves 10.10
 - ”j-shaped”
 - ”s-shaped”
 - d) Growth rate curves
 - e) Human population growth patterns

C. Population regulation

1. Oscillation models 10.11
2. Oscillation patterns
 - a) Extrinsic
 - b) Intrinsic
 - c) Classic examples
 - snow shoe hare
 - lemmings
 - migratory locust
 - periodical cicada
3. Factors regulating oscillations
 - a) Density independent factors 11.12

- b) Density dependent factors 11.1
- D. Intraspecific competition
 - 1. Scramble vs contest competition 11.2
 - 2. Non-Specific mechanisms to avoid competition
 - a) Dispersal 9.6, 11.6
 - emigration
 - immigration
 - migration
 - c) Specific mechanisms to avoid competition 11.5
 - 11.8, 11.9, 11.10,
 - maintain individual distance
 - territoriality
 - gregarious behavior
 - dominance hierarchies
 - social structures
- E. Life history patterns
 - 1) Reproductive effort 12.7
 - 2) Timing of reproduction 12.12
 - 3) Parental investment (r & k) 12.8
 - 4) Age, size & fecundity 12.11
 - 5) Mating strategies and fitness
 - a) sexual selection 12.4, 12.5
 - b) mating systems 12.3

IV- Community Ecology

- A. Types of interspecific interactions 13.1
- B. Interspecific competition 14.1,
 - 1) Early observations & experiments 14.3
 - a) Gause's experiments
 - b) Connell's experiments
 - c) Park's experiments
 - 2) Models of outcomes 14.2
 - a) stability
 - b) instability
 - c) exclusion
- C. Resource partitioning 14.7, 14.8, 14.9
 - 1) Classic experiments
 - a) animal example-Cody's birds
 - b) plant example-Whittaker's trees
 - 2) Niche' revisited 14.10, Focus p.282-283
 - a) Hutchinsonian niche' concepts
 - fundamental niche'
 - realized niche'
 - b) niche' overlap
 - c) niche' dimensions

- d) niche' compression
- e) niche' shift

D. Predation

- 1) Scales of predation 15.1
- 2) Natural history of predation (notes only)
 - a) Predator adaptations
 - morphological features
 - digestive specializations
 - sensory specializations
- 3) Natural history of prey adaptations 15.9, 15.14
 - a) Avoidance
 - b) Fighting
 - c) Chemical defense
 - d) Crypsis
 - background matching
 - disruptive coloration
 - counter shading
 - e) Mimicry
 - non-food items
 - Batesian mimicry
 - Mullerian mimicry
 - Aggressive mimicry
 - f) Plant defenses
 - structural
 - life history strategies
 - chemical
- 4) Quantitative aspects of Predator/Prey interactions
 - a) Math models of predator/prey interactions 15.2
 - b) Model predictions 15.3, 15.4
- 5) Miscellaneous topics related to predation
 - a) Cannibalism
 - b) Optimal foraging 15.11, 15.12
 - Optimal diet
 - Optimal foraging efficiency

E. Herbivore/plant systems 15.15

F. Symbiosis 16.11-16.17

- 1) Amensalism
- 2) Commensalism
- 3) Protocooperation
- 4) Mutualism