Study Guide for Test 2 — Bio 213 — Evolution — Fall 1996

I. Structure of the Test

A. You will have 2 problems/derivations to work, each worth 20 points. These will be from among the following:

1. derive and solve the recurrence equation for selection on a recessive lethal
2. test a certain population for being in the H-W genotype frequencies
3. derive the generalized recurrence equation for selection
4. interpret a Δq graph.
5. graphically derive the equation for heritability
6. graphically derive the recurrence and Δq equations for migration.

B. There will be two multiple choice questions per chapter on the book material for which you are responsible. The ten chapters for which you have responsibility are 2, 4, 5, 6, 7, 9, 10, 11, 12, and 13. Each of these 20 questions will cover one or more of the chapter summary points and be worth 2 points on the test.

C. There will be 2 short-answer questions, each worth 10 points. Possible topics **include, but are not limited to**, the following:

1. Describe the three major modes of selection.
2. Define natural selection, variation, adaptation and fitness.
3. Tell the conditions under which natural selection will occur. Explain your terms in plain English.
4. Describe the five major forces causing evolution. For each force, tell whether it is strong, weak or dependent on condition(s). If dependent on condition(s), tell the condition(s) under which it would have greater effect changing gene frequencies.
5. Tell why there are two sexes, why the sexes differ, and why there is usually a 50:50 sex ratio. Explain the two main theories of female choice.

II. Lecture Material

A. You are responsible for all of the lecture notes material listed below, even if not lectured on. This includes the "Basic Principles of Genetics", "Natural Selection, Variation, and the Hardy-Weinberg Law", "The Forces that Cause Evolution", "Neutral Loci, Two-locus, multi-locus and quantitative Evolutionary Genetics **(Sections I and IV only; skip sections II and III)**"and "Genome Evolution, Analysis of Adaptation, Units of Selection, and Adaptive Explanation" Lectures. Notes for the lectures are available at the copy center.

III. Book Material

A. You are responsible for the following material in the book:

1. Chapters 2, 4 & 5: all of this material
2. Chapter 6: all of the summary points
3. Chapter 7: chapter summary points 1, 6, and 12
4. Chapter 9: chapter summary points 1, 2, 3 and 4.
5. Chapter 10: chapter summary points 1, 2, 3, 8, and 9.
6. Chapter 11: chapter summary points 1 through 10.
7. Chapter 12: chapter summary points 1, 7, 8, 9, 10 and 11.
8. Chapter 13: chapter summary points 2, 4, 5, 7, and 8.
9. Chapters 15 & 16: **NOT** covered by this test

B. In order to understand the chapter summary points listed above, you will need to read the appropriate sections of the chapters.