ZOL 415, Spring 2002: Last year’s final exam study questions.

• For the final exam, the format will be one essay question (one of the questions below) and a few short answer questions (based on topics listed here.)
• I will choose which one, so come prepared to answer all of them.
• You can prepare however you like. I suggest that you discuss your planned answers with your classmates. You may write out answers in advance, but you cannot bring those pre-written answers into class (except in your brain).
• At the exam you will need to write the essay on a clean sheet of paper (bring one). I’m looking for one page of excellent prose that gets at the critical points.
• The exam is worth 30 points (15 for essay, 15 for short answers), which is 15% of the class grade.

1. What is an adaptation? How can we test hypotheses about the adaptive function of traits? Why aren’t adaptations ‘perfect’? Use an example(s) from lecture or discussion to help explain your points.

2. Use an example(s) from lecture to help explain a ‘genotype x environment interaction’ (GxE) on variation in a behavioral trait.

3. Use an example(s) from lecture or discussion to show how the threat of predation changes the behavior and physiology of potential prey. Explain why this happens in terms of costs & benefits.

4. Use examples from lecture or discussion to illustrate the costs and benefits of group living.

5. Use examples from lecture to illustrate and help explain how density and frequency dependent processes influence the outcomes of competitions for resources.

6. Using examples from lecture, describe why animals signal. What is being advertised? What are the costs and benefits of signaling?

7. Are mate preferences learned or innate? Use an example(s) from lecture to illustrate.

8. Using examples from lecture to help explain why paternal care is a benefit for the female. Describe the tradeoff facing females between investments in current offspring and investments in future offspring.

9. Explain why, at first glance, altruism seems to be a problem that needs a special explanation in evolutionary biology. Use examples from lecture to illustrate the four generally accepted hypotheses for altruism in various systems.