• The final exam will be one essay question from the list of 8, below.
• 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 1-2 pages of excellent prose that gets at the critical points.
• The exam is worth 20 points, which is 20% of the class grade. Note that this is equivalent to 10 quizzes; your answer should be much more developed than the typical good quiz answer.

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

2. Use examples from lecture or discussion to help explain the logic and predictive value of Optimal Foraging Theory.

3. Use examples from lecture or discussion to show how the threat of predation changes the behavior and physiology or morphology of potential prey. Explain why this happens in terms of ultimate costs & benefits.

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

5. Using examples from lecture or discussion, explain why and what animals signal during sexual selection and mate choice. What are the costs and benefits of signaling in your examples?

6. Use examples from lecture or discussion to help illustrate and explain the tradeoff parents face, between investments in current offspring and investments in future offspring.

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

9. Use examples from lecture and discussion to help explain the costs and benefits of sociality and describe some behavioral and physiological adaptations organisms have for living in groups. Your analysis should include consideration of “social intelligence.”