Course: Examination of the adaptive significance of behavior in an ecological context. Topics include the evolution of social behavior, mating systems, sexual selection, alternative reproductive behaviors, life history strategies, optimal foraging, territoriality, cooperation and conflict, host-parasite co-evolution, the ecology of communication, and comparative analyses. The course emphasizes basic concepts and theory as well as model-based and experimental approaches to exploring questions in Behavioral Ecology. Empirical examples will emphasize vertebrate animals, but some examples will involve other metazoans (e.g., insects and such) and human behavior.

Students complete a semester long project on a topic of their choice. The project includes the development of a bibliography on a particular topic, the design of an experiment to test a specific hypothesis, a review paper, and class presentation. Questions and discussion are encouraged during lecture. Three hours lecture, one hour discussion. Two exams.

Prerequisites: One upper level course in ecology (BI303), animal behavior (BI407), or evolution (BI504)

Lecture: MWF, 11am, CAS 226   Discussion: W, 4 pm (BRB121) or Th, 11 am (BRB121)

Instructor: Michael Sorenson, BRB529, 5 Cumington St.
e-mail: msoren@bu.edu (preferred over phone)
phone: 617-353-6983
office hours: M 2-4, Th 10-11 or by appointment
web: http://people.bu.edu/msoren/BI508.html

Required Texts:
NONE: readings will be assigned, including papers from the primary literature for weekly discussion.

Other recommended texts:

Course Requirements:
1. Attend all lectures (unexcused absences will result in low grade for class participation)
2. Participate in weekly discussion and lead one discussion
   Papers for discussion will be distributed in class or will be available on the course web page. These papers should be read PRIOR to the discussion section. Come to discussion prepared with written questions and/or comments on each paper.
Course Requirements (continued):

3. Offer insightful, thought-provoking comments and questions in lecture and discussion

4. Read the NY Times Science Section (Tuesdays) and other media and tell the professor and/or class about interesting new stories/research relating to behavioral ecology

5. One mid-term exam (28 Feb) and one final exam (TBA)

6. Complete a semester-long project on a topic of your choice:
   - Phase 1: compile bibliography of relevant literature
   - Phase 2: write literature review on your topic
   - Phase 3: design an experiment to test a specific hypothesis related to your chosen topic (or produce an original model)
   - {Phase 4: present your chosen topic to the class (15 minute oral presentation)}

7. Conversations with fellow students about your research topic are encouraged, but written papers for phase 2 and 3 of your project should be your own work, done independently, by yourself. These may be submitted electronically via the website: http://www.turnitin.com/

Note: assignments completed after the due date are better than nothing at all, but should be of exceptional quality to reflect the additional time taken to complete them

8. Students are responsible for knowing, understanding, and adhering to the provisions of the CAS Academic Conduct Code. Copies are available in room CAS 105.

Paper Format

Papers (for Phase 2 and 3 of project) should take the form of a concise review paper and a research proposal, respectively. Examples of the former can be found in Trends in Ecology and Evolution. For both, the name-date citation format should be used, with author(s) last name(s) and date cited in the text and references listed in alphabetical order in a References Cited section at the end of the paper. Formatting of references (in all three assignments) and other aspects of your papers should follow as closely as possible that found in the journal Behavioral Ecology.

Please see the following website and the pages therein for additional direction on scientific writing and proper citation of references.
   http://www.turnitin.com/research_site/e_home.html

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Class participation</td>
<td>10%</td>
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<tr>
<td>Project (Phase 1 – topic/bibliography)</td>
<td>5%</td>
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<tr>
<td>(Due 3 February)</td>
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<tr>
<td>Project (Phase 2 – review paper)</td>
<td>15%</td>
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<td>(Due 20 March)</td>
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<td>Project (Phase 3 – experiment)</td>
<td>15%</td>
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<td>(Due 10 April)</td>
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<td>Project Presentation</td>
<td>10%</td>
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<td>Exams (20%, 25%)</td>
<td>45%</td>
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<tr>
<td>(Mid-term: 28 Feb, Final: TBA)</td>
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Lecture Schedule: **TENTATIVE **

17 January: Lion social behavior and Tinbergen’s four questions
19 January: Formulating and testing hypotheses – optimal clutch size
22 January: The “evolution” of Behavioral Ecology
24 January: Evolution by natural selection
26 January: Genes and behavior
29 January: Testing hypotheses, the comparative approach
31 January: Phylogeny and the comparative approach
2 February: The ideal free distribution-1
5 February: The ideal free distribution-2
7 February: The IFD concept in other contexts, negative frequency dependence
9 February: Territoriality or living in groups
12 February: Evolutionarily stable strategies:
14 February: Fighting and assessment: asymmetric contests, escalation
16 February: Anisogamy and the ESS sex ratio
20 February: Extraordinary sex ratios
21 February: Sexual selection
23 February: Mating Systems, the parental care game
26 February: The polygyny threshold, avian “monogamy”, EPCs and paternity analysis

28 February: Mid-term Exam

2 March: Alternative reproductive behaviors, strategies and tactics
5 March: Reproductive strategies of female redheads
7 March: Condition dependence and frequency dependence in ARBs
9 March: Kin selection
19 March: Cooperation
21 March: Individual and kin recognition
23 March: Cooperative breeding
26 March: Cooperative breeding (cont.)
28 March: Optimal foraging: starlings
30 March: Optimality: prey choice, risk-prone vs. risk averse
2 April: Optimal foraging: constraints, state-dependent behavior
4 April: Co-evolutionary arms races: crypsis and aposematism
6 April: Co-evolution of brood parasitic indigobirds and their hosts
9 April: Brood parasitism: cowbirds and cuckoos
11 April: Communication and the design of signals
13 April: Communication and the design of signals
18 April: Altruism in social insects
20 April: Haplodiploidy and the evolution of eusociality
23 April: Catch-up
25 April: Presentations?
27 April: Presentations?
30 April: Presentations?
2 May: Presentations?

FINAL EXAM: Date & Time TBA